

TM 5-4086

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## MAINTENANCE INSTRUCTIONS AND PARTS CATALOG

WAR DEPARTMENT • DECEMBER 1943

# TM 5-4086

## WAR DEPARTMENT

WASHINGTON 25, D. C. (DECEMBER, 1943)

TM5-4086 Maintenance Manual and Parts Catalog for Drill, Pneumatic, Portable, Reversible, No. 3 Morse Taper, Independent Pneumatic, Thor, No. 362RX-3, is published for the information and guidance of all concerned.

(AG 300.7, (23 Aug., 1943)

By order of the Secretary of War:

G. C. MARSHALL  
*Chief of Staff*

Official

J. A. ULIO,  
*Major General,  
The Adjutant General*

Distribution: X

# TM 5-4086

## WAR DEPARTMENT MAINTENANCE MANUAL AND PARTS CATALOG

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DRILL, PNEUMATIC, PORTABLE,  
REVERSIBLE, No. 3 MORSE TAPER,  
INDEPENDENT PNEUMATIC, THOR,  
SIZE No. 362-RX-3

**INDEPENDENT PNEUMATIC TOOL COMPANY**  
CHICAGO, ILL.  
DECEMBER, 1943

MANUFACTURED FOR THE CORPS OF ENGINEERS

USPO  
NUMBERS  
BA-1137

CONTRACT  
NUMBERS  
W-174-ENG-1956

I.P.T.CO. O.  
NUMBERS  
C-164234

SERIAL  
NUMBERS  
All  
Model  
No. 5121  
Serial Nos.

*Manufactured by*  
**INDEPENDENT PNEUMATIC TOOL CO.**  
600 W. Jackson Boulevard  
CHICAGO, ILLINOIS

Page 1

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## GENERAL DESCRIPTION

The Thor No. 362RX-3 Pneumatic Drill is powered by rotary type reversible motor designed to operate at a spindle speed of 450 RPM without load and to deliver its rated drilling capacity of 1" in steel on an air line pressure of 90 lbs. per square inch. The drill is equipped with reversible twist throttle control, dead handle, grip handle or feed screw and spindle with internal No. 3 Morse Taper Socket to accommodate drills, reamers and taps with No. 3 Morse Taper Shank.

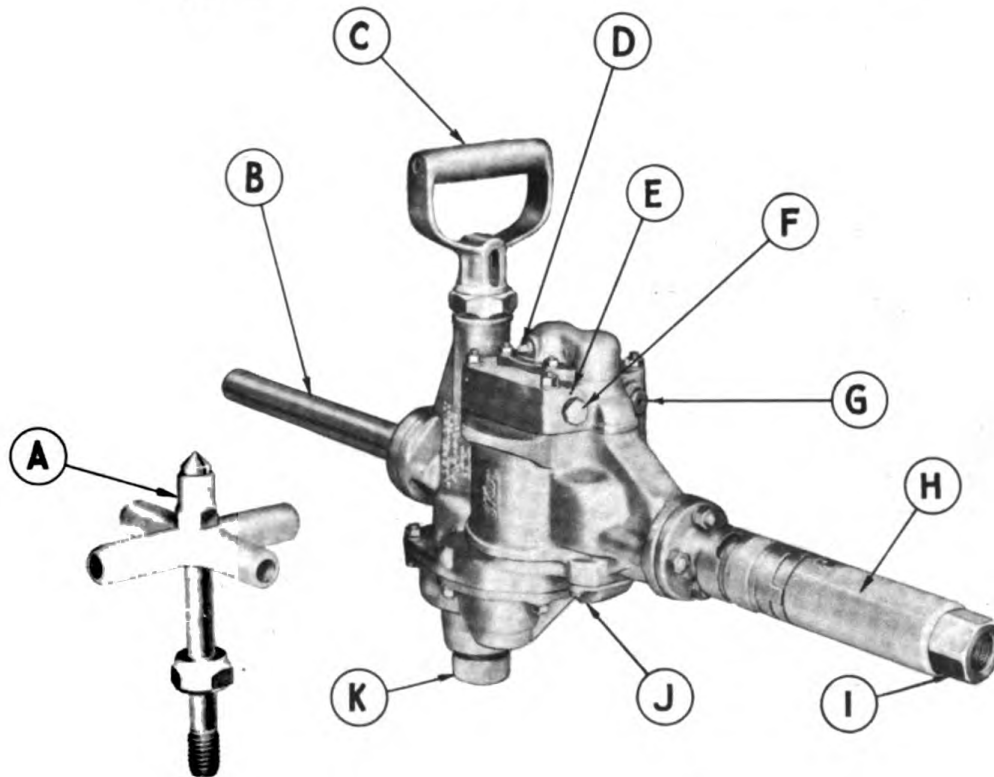
## SPECIFICATIONS

## Thor No. 362RX-3 Rotary Pneumatic Drill

Capacity . . . . .	Drilling 1" Reaming 15/16" Tapping 7/8"
Speed. . . . .	450 RPM
Weight . . . . .	28-1/4 lbs.
Length overall . . . . .	14"
Spindle offset . . . . .	1-13/16"
Morse taper. . . . .	No. 3
Operating Airline Pressure . . . . .	90 lbs. per sq. inch.

# IDENTIFICATION OF MAJOR UNITS

## *Thor* No. 362RX-3 Rotary Pneumatic Drill



**A. FEED SCREW UNIT**—is interchangeable with the grip handle unit (C). The feed screw unit is used when pressure is required to feed the cutting drill into steel or similar material. When drilling through steel a stationary beam or backing is braced against the top of the feed screw center and as the feed screw handle is rotated to the left in a counter-clockwise direction, the feeding process progresses.

**B. DEAD HANDLE**—held in drill by dead handle reducer. Facilitates holding drill rigid against rotation of entire tool when operating. Easily removed by unscrewing from the reducer.

**C. GRIP HANDLE**—securely fastened to the drill by means of a right hand thread and lock nut. May be positioned in any desired direction.

**D. GREASE NIPPLES (2)**—one grease nipple on side of cylinder cap and one grease nipple on side of gear case provide for application of grease to all vital points of the drill with a pressure grease gun.

**E. VENT HOLE**—located on side of cylinder cap allows excess grease or air pressure to escape. Must be kept open at all times.

**F. OIL RESERVOIR PLUG**—marks opening through which lubrication is applied to oil regulator plunger for distribution to the motor by air pressure.

**G. OIL REGULATOR CAP (round)**—retains oil regulator plunger in oil regulator bushing.

**H. THROTTLE CONTROL**—enables operator to start, stop and control both speed and direction of rotation.

**I. THROTTLE CAP**—provides for connection of air hose by means of 1/2" pipe thread Hose Nipple or Coupling. Throttle cap contains air strainer.

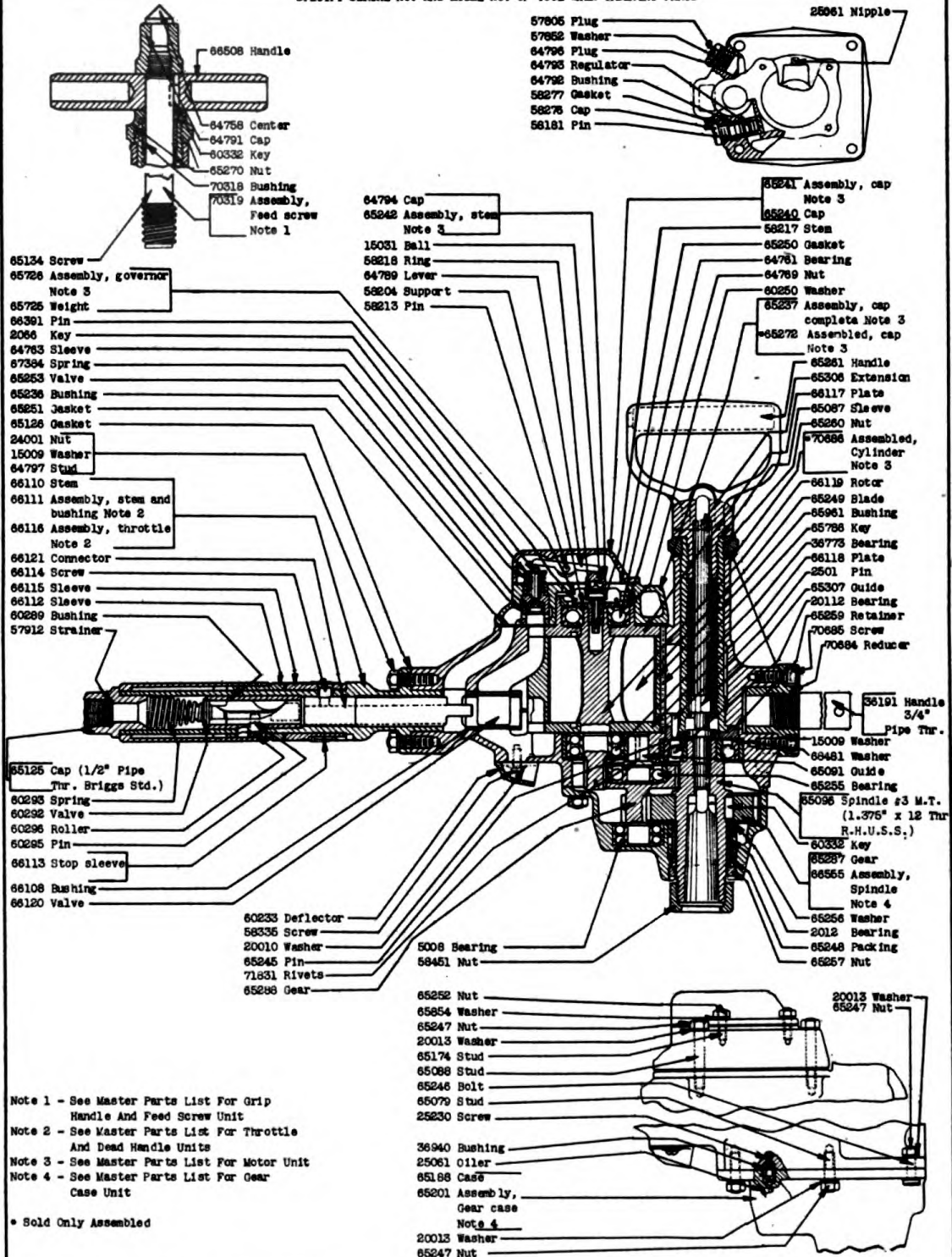
**J. DEFLECTOR**—disperses exhaust air leaving the motor. It must be kept open at all times.

**K. SPINDLE AND PROTECTION NUT**—spindle is made with an internal No. 3 Morse Taper Socket to accommodate drill, reamers and taps with a No. 3 Morse Taper Shank.



INDEPENDENT PNEUMATIC TOOL CO.  
CHICAGO ILL.  
PNEUMATIC ROTARY DRILL  
NO. 362 RX-3 MODEL NO. 5121

SPECIFY SERIAL NO. AND MODEL NO. OF TOOL WHEN ORDERING PARTS



Printed In The United States Of America



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## WHAT TO DO

## BEFORE STARTING NO. 362RX-3 ROTARY PNEUMATIC DRILL

1

This drill was given a rigid operating test and final inspection before it was shipped from the factory. We recommend that you read and follow the procedure outlined below before starting and placing the machine in service.

## LUBRICATION

## Oil Lubricant

1. Fill oil reservoir with proper grade of oil (See Lubricant Chart, page 6) (Note: Refill oil reservoir every 4 hours. NEVER ALLOW TO RUN DRY)
2. Apply small amount of OE-10 oil through air inlet opening in Throttle Control Unit. (See letter "I", Major Unit Identification, Page V.)
3. Blow out air hose to remove water and dirt.
4. Connect air hose to air inlet of Throttle Control Unit.
5. Twist Throttle Valve Sleeve to the left to wide open position to flush oil through motor.
6. Turn drill off and check grease.

## Grease Lubricant

1. Apply proper grade grease (see Lubricant Chart, page 6) sparingly through nipples on side of No. 65237 Cylinder Cap and No. 65201 Gear Case. (Two (2) Grease Nipples.)
2. Apply grease every 64 hours.

## Operating Air Line Pressure

1. Check air pressure. Normal operating airline pressure is 90 lbs. per square inch.
  - (a) Lower pressure will reduce operating efficiency.
  - (b) Higher pressure will cause undue wear and requires that the operator be especially careful to have complete control of the machine.
2. See that 3/4" inside diameter air hose is used. This is essential to maintain a sufficient supply of air.

3. See that Vent Hole and Deflector Exhaust Outlet are clear of obstructions.

#### Drill Bit Inspection

1. Inspect the shank end of cutting tool to be used.
2. Examine the entire bit for flaws.
3. Check all screws and nuts on machine to be sure they are tight.

#### Placing Bit in Spindle

1. The No. 65096 Spindle is made with an internal No. 3 Morse Taper Socket to accommodate drills, reamers and taps with a No. 3 Morse Taper Shank.
2. Simply insert the shank of cutting tool into the spindle socket firmly.
3. Spindle has a 1-3/8" x 12 right hand U.S.S. thread to accommodate knurled No. 58451 Protection Nut.
4. Clean the inside surface of the spindle and the outside surface of the shank of the cutting tool.

NOTE: Cutting tools with a different size of Morse Taper shank may be used, providing a Morse Taper Adaptor Sleeve is fitted in No. 65096 (No. 3 Morse Taper) Spindle. The adaptor sleeve has a No. 3 Morse Taper outside shank to fit inside the spindle and an inside Morse Taper socket to accommodate the cutting tool.

#### Connecting Air Hose to Tool

1. Always blow out the air hose before connecting it.
2. Blow off hose nipple to free any small particles of dirt, scale or other foreign matter lodged inside.
3. Check air strainer inside Throttle cap to be sure it is clean.

#### OPERATION OF DRILL

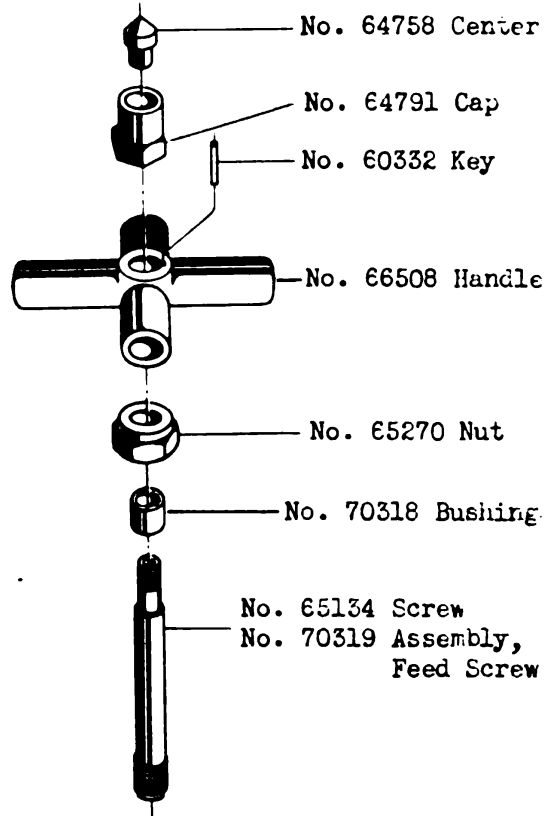
##### A. When Using Feed Screw:

The Feed Screw Unit is used when pressure is required to feed the cutting tool into steel or similar difficult material. In drilling, a stationary beam or backing is braced against the No. 64758 Feed Screw Center (See Illustration No. 1) and as the No. 66508 Feed Screw Handle is rotated to the left, in a counter-clockwise direction, the feeding process progresses.

All but the bottom 1/2" travel of the No. 65134 Feed Screw may be used in the feeding process. The bottom 1/2" travel of the Feed Screw is used only when expelling the cutting tool by screwing the Feed Screw down to the bottom of its inward travel.

The rate of feed depends upon the hardness of the material.

NOTE: The Feed Screw Unit, consisting of parts shown in Illustration No. 1, is interchangeable with the Grip Handle Unit. No. 70318 Feed Screw Guide Bushing is used only in the Feed Screw Unit. (No. 65087 Feed Screw Sleeve and No. 65245 Ejecting Pin, located at bottom end of No. 65087 Feed Screw Sleeve (not shown in Illustrations No. 1 or No. 2) are used with both Grip Handle and Feed Screw Units.)



3

Illustration No. 1  
Exploded View  
of Feed Screw Unit

### B. When Using Grip Handle

The No. 65261 Grip Handle is used in general service operations where the extreme pressure feed of the Feed Screw is not required.

The Grip Handle is grasped in one hand and the Throttle Handle in the other. The Operator brings pressure to bear on the Grip Handle when drilling.

The No. 65261 Grip Handle may be turned to the desired position by loosening the No. 65260 Lock Nut, turning the Grip Handle and tightening the Lock Nut again.

The slotted hole in the No. 65261 Grip Handle and the No. 65306 Ejecting Pin Extension are used when expelling a tightly wedged drill shank from the No. 65096 Spindle.

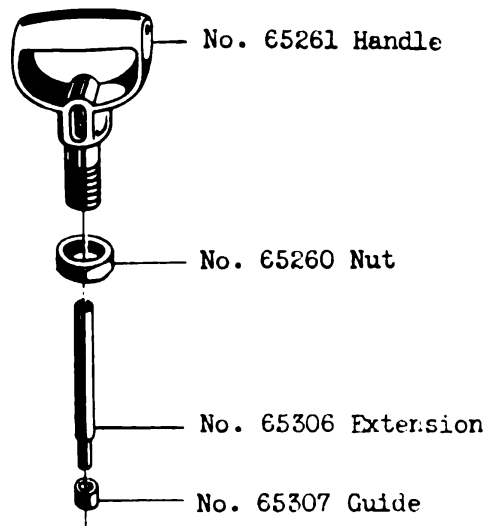


Illustration No. 2  
Exploded View  
of Grip Handle Unit

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- (a) Insert a wedge in the slotted hole in the No. 65261 Handle.
- (b) Pry down on the No. 65306 Ejecting Pin Extension.
- (c) The Ejecting Pin Extension, in connection with the No. 65245 Ejecting Pin will force the cutting tool out of the spindle.

#### C. General Operating Procedure.

Whether using Grip Handle or Feed Screw, the following operating procedure applies.

1. Grasp the Throttle Handle with one hand and the Grip Handle or Feed Screw with the other hand.

(When two men operate the drill, one holds the Dead Handle to prevent turning of the machine and also to bring added pressure to bear.)

2. Place the point of the cutting tool at the position which is to be the center of the hole to be bored.
3. Open the throttle gradually by turning the No. 66115 knurled Operating Sleeve counter-clockwise to the left to forward running position. (Marked by letter "F" on throttle handle.)
4. Exert effort against the tendency of the machine to rotate.
5. Continue turning the No. 66115 Sleeve to the wide open position as the cutting tool enters the material.
6. Should the cutting tool become stuck or the drill stall, reverse the rotation of the drill to back out the tool.

#### To Reverse:

- (a) Turn the Throttle Sleeve clockwise to the right to reverse running position. (Marked with letter "R" on Throttle Handle.)
  - (b) Continue operating machine in reverse rotation until cutting tool is free.
7. Throttle Handle cannot be locked in either Forward or Reverse running position; it must be held in desired position manually.
  8. "OFF" position is midway between Reverse and Forward.
  9. Never tilt the cutting tool from the direction in which the hole is being bored.

## FIELD SERVICE OPERATIONS

The following minor servicing jobs should be done in the field occasionally by the machine operator to insure the most efficient operation of the drill and to prevent unnecessary wear or breakage caused by neglect of the machine.

## Clean No. 64793 Oil Regulator Plunger

1. After each 48 hours of actual operation, remove the No. 58276 Oil Regulator Cap (located on the side of No. 65237 Cylinder Cap Assembly). Use a 3/16" Hex. Wrench.
2. Remove No. 64793 Oil Regulator Plunger.
3. Clean plunger in solvent.
4. Replace Plunger and Cap.

## Lubricating Throttle Parts

1. When operating drill, apply OE-10 oil every four hours to Throttle Parts through small hole located in the No. 66115 Operating Sleeve when at "OFF" position.

## FIELD LUBRICATION

4

Proper and sufficient lubrication is the most important single factor in keeping performance of the drill at a maximum and repairs at a minimum.

## Oil Lubrication (every four hours)

4

1. Apply proper grade of oil through No. 57805 Oil Plug Hole to fill Oil Reservoir.
2. Apply proper grade of oil through oil hole in No. 66115 Operating Sleeve.

## Grease Lubrication

5

1. Apply proper grade of grease lubricant through the two (2) No. 25061 Grease Nipples with a high pressure grease gun every 64 hours.

## LUBRICATION SPECIFICATIONS

	Temperatures	U. S. Army Symbol
Oil	Below 32° F.	OE-10 (oil, engine, SAE-10)
	Above 32° F.	Mixture of equal amounts of OE-10 and OE-30 oils. (oil, engine, SAE-10 and SAE-30)
Grease	Below 32° F.	CG-0 (grease, general purpose, No. 0)
	Above 32° F.	CG-1 (grease, general purpose, No. 1)

Always use clean oil. Under no circumstances should old crank case oil be used.

Oil or Grease which has been standing in an open container collecting dust and dirt should not be used.

## EXTREME WEATHER CONDITIONS

## Hot Weather Operation

The No. 362RX-3 Drill will operate in extreme high temperatures without adjustments.

1. Lubrication - particular care should be given that proper grade lubricant is used.
2. Check lubrication frequently.
3. Keep parts clean.
4. Check air strainer to assure against accumulation of dirt.

## Cold Weather Operation

1. Follow all ordinary service operations.
2. Be sure proper grade oil and grease is used.



## PREPARING DRILL FOR STORAGE

Refer to TM5-9715, Preparation of Corps of Engineers Equipment for Storage, issued by the Engineers Field Maintenance Office, P. O. Box 1679, Columbus, Ohio.

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## SUMMARY OF SERVICING OPERATIONS

Proper and complete maintenance and servicing of the No. 362RX-3 Drill requires thorough inspection, cleansing and lubrication of each and every part at least once every 2048 hours. If the drill is used continuously, the servicing job should be done more frequently.

9

1. To accomplish the above procedure, each unit assembly should be disassembled into its component parts. (A unit assembly is a group of parts assembled together to perform a definite function in the operation of the machine.)
  - (a) Thoroughly inspect each part for worn bearing surface as well as for corroded sections.
  - (b) If the part is badly worn and beyond repair, it should be replaced.
  - (c) Assembly of new parts in conjunction with badly worn parts may cause rapid failure of both parts.
- (a) Thoroughly clean each part in a dirt and grease cutting solvent.
  - (b) Lubricate the separate parts with OE-10 oil.
  - (c) Reassemble parts to complete the unit assembly.
3. All unit assemblies, each having been properly serviced, may then be assembled together to complete the final assembly of the Drill.

## GENERAL INFORMATION

When reading the following instructions, refer to the exploded views as well as to the cross sectional drawings of the assembled tool for further information regarding the appearance or design of each part and its relationship with the parts adjacent to it.

## IDENTIFICATION OF MAJOR UNITS

The Thor No. 362RX-3 Drill may be divided into three major unit assemblies or part groups:

- (a) Throttle Handle Unit - consists of all parts pertaining to operation of the throttle.
- (b) Motor Unit - consists of grip handle and dead handle, governor cap assembly, cylinder cap assembly, cylinder assembly and all other parts which assemble to complete the motor unit.
- (c) Gear Case Unit - consists of spindle and gear as well as other parts assembled in the gear case.

These classifications are based on the manner in which the servicing operations should proceed. Disassembling and reassembling operations as well as the necessary servicing instructions pertaining to each major unit as described herein.

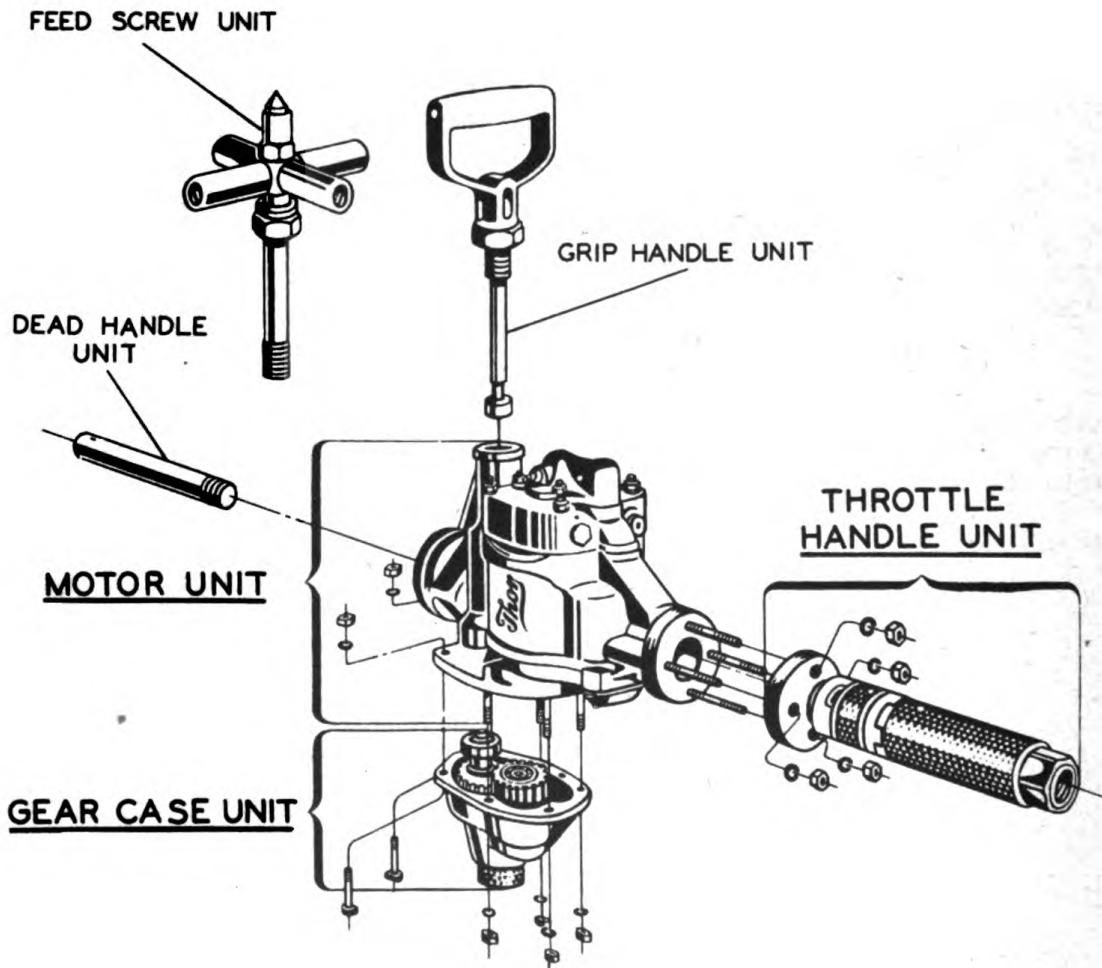


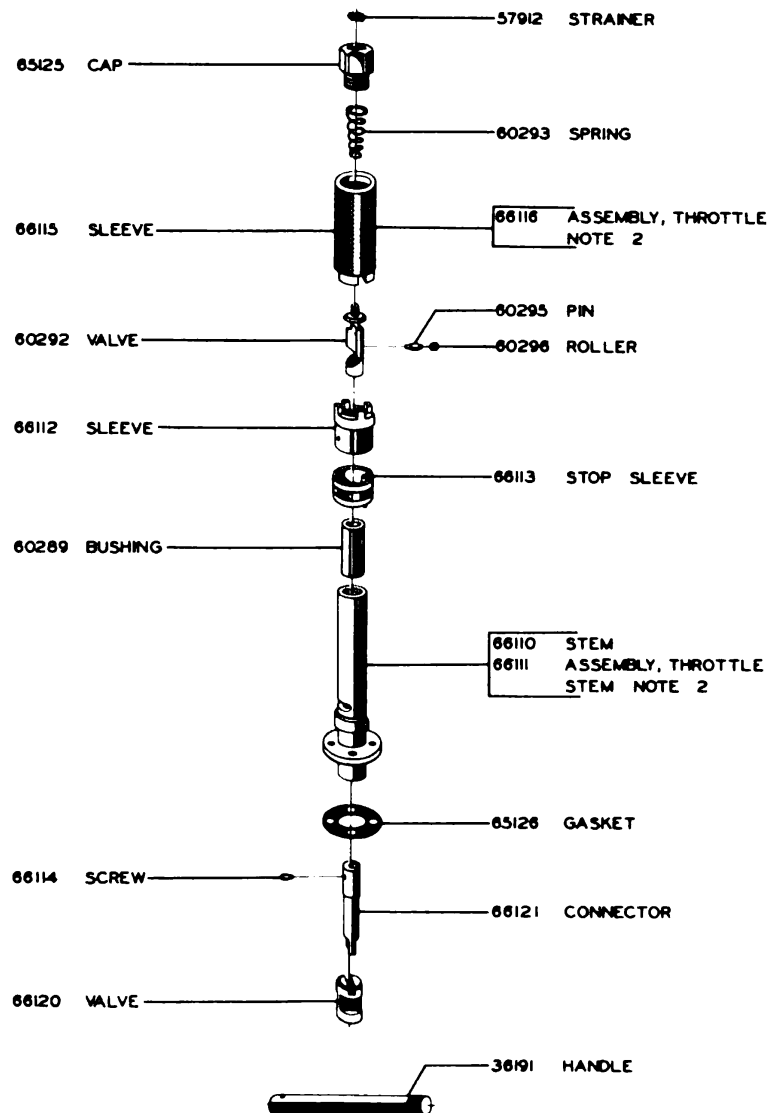
Illustration No. 3  
Exploded Drawing of Complete Tool.

### Disassembly of Drill into the 3 Major Units

1. Unscrew the 4 No. 24001 Throttle Handle Stud Nuts to remove the Throttle Handle.
2. Unscrew the 6 No. 65247 Gear Case and Cylinder Bolts and Stud Nuts to remove the Gear Case Unit, as shown in Illustration No. 3.
3. The No. 36191 Dead Handle may be removed by unscrewing from No. 70684 Dead Handle Reducer.

### THROTTLE HANDLE UNIT

11



NOTE 2: SEE MASTER PARTS LIST FOR THROTTLE AND DEAD HANDLE UNITS

Illustration No. 4  
Exploded View of Throttle Handle Unit

**Disassembly of Unit**

1. Unscrew No. 65125 Throttle Cap to remove the No. 66115 Operating Sleeve and No. 60293 Throttle Spring from No. 66116 Throttle Assembly.
2. Remove No. 60292 Throttle Valve by lifting out No. 60296 Operating Valve Roller.
3. Remove No. 66121 Valve Connector from the motor end of the No. 66116 Throttle Assembly by unscrewing the No. 66114 Valve Connector Screw.
4. Since No. 60289 Throttle Valve Bushing is a press fit in the No. 66111 Throttle Stem Assembly, it should only be removed if considerably worn resulting in air leakages. (See "Servicing Operation for Stopping Air Leakages" below).
5. No. 66120 Reversing Valve can be removed by tapping the No. 70686 Cylinder Assembly against a wood block.
6. Clean all parts in solvent and lubricate.

**Inspection and Repairs****1. No. 75912 Strainer:**

- (a) If No. 57912 Strainer is in good condition, its removal from No. 65125 Throttle Cap is not necessary. However, if the wire mesh in the No. 57912 Strainer is damaged it should be replaced.
- (b) The No. 57912 Strainer should be pressed into No. 65125 Throttle Cap so that its curvature center points outward.

**2. No. 60293 Throttle Spring**

Since No. 60293 Throttle Spring holds No. 60292 Throttle Valve against seat of No. 60289 Throttle Bushing, its replacement is important if its tension decreases.

**3. Servicing Operation for Stopping Air Leakages**

- (a) If air leakages are noticeable in region of No. 66116 Throttle Assembly when operating the Drill, it is most likely due to a worn No. 60289 Throttle Valve Bushing. If such is the case, replacement of No. 60289 Throttle Valve Bushing is necessary.
- (b) The worn No. 60289 Throttle Valve Bushing is removed from No. 66111 Throttle Stem Assembly as follows:
  - (1) Plug seat end of No. 60289 Bushing by screwing in a 3/4" thread tap.



- (2) Insert a 1/2" diameter rod through opposite end of the No. 66111 Throttle Stem Assembly to bear against tap.
- (3) Press out No. 60289 Bushing.
- (c) Correct reassembly of No. 60289 Bushing into No. 66111 Throttle Stem Assembly is very important.
  - (1) Press No. 60289 Bushing into No. 66111 Throttle Stem Assembly so that the slotted hole in bushing is precisely lined up with corresponding hole in No. 66111 Throttle Stem Assembly.
  - (2) No. 71783 Drift as shown in Illustration No. 5 can be used for pressing in the No. 60289 Bushing.

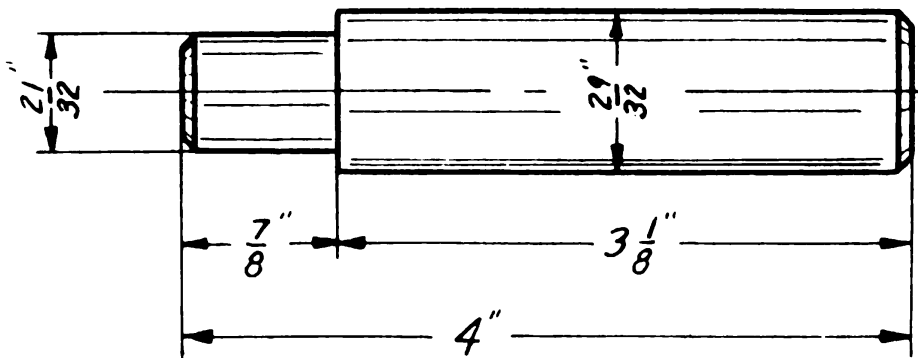


Illustration No. 5  
No. 71783 Drift for Pressing in  
No. 60289 Throttle Valve Bushing

- (d) Insert No. 60292 Throttle Valve into No. 60289 Throttle Valve Bushing.
  - (1) If the valve feels loose, it must be replaced.
  - (2) If No. 60292 Valve tends to bind and does not work freely, it may be freed up by working valve into No. 60289 Bushing using lard oil.
  - (3) No. 71785 Wrench (shown in Illustration No. 6) which screws onto No. 60292 Throttle Valve may be used to hold the valve securely in the above operation.
  - (4) If No. 60292 Throttle Valve cannot be inserted into No. 60289 Bushing, then ream the Bushing with a combination reamer. (The size of which corresponds with the actual size of No. 60292 Valve.)

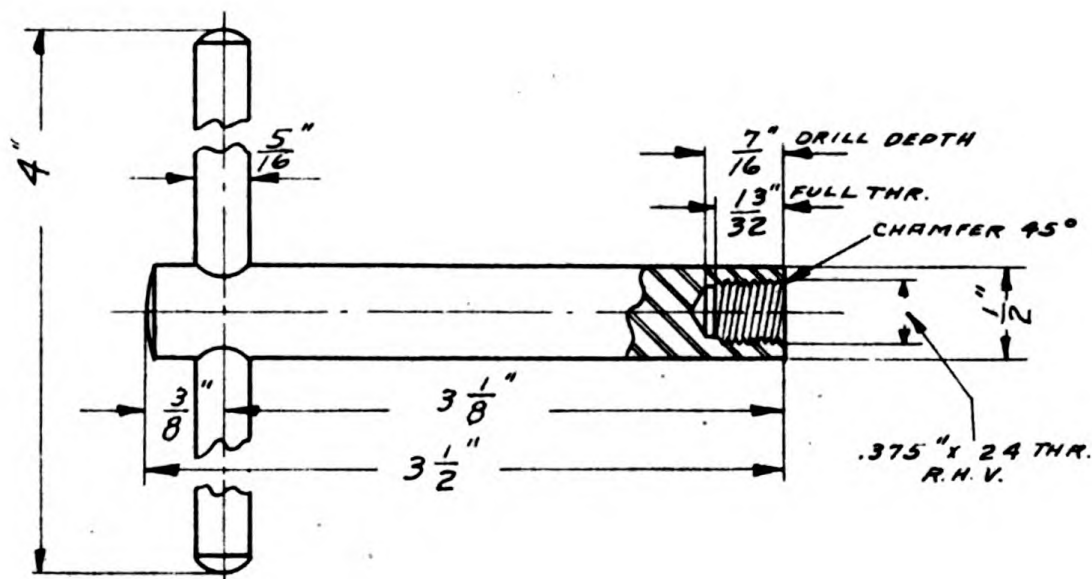


Illustration No. 6  
No. 71785 Wrench for Holding  
No. 60292 Throttle Valve Securely

- (5) If a new No. 60292 Valve is used, No. 71784 Combination Stem and Seat Reamer (shown in Illustration No. 7) may be used for reaming No. 60289 Throttle Valve Bushing.

NOTE: A combination reamer is used so that the 45-degree Valve Seat is reamed concentrically with center line axis of No. 60289 Throttle Valve Bushing.

- (6) No. 60292 Throttle Valve may now be inserted into No. 60289 Throttle Bushing and if necessary may be "freed up" using lard oil. (Never use an abrasive lapping compound.)

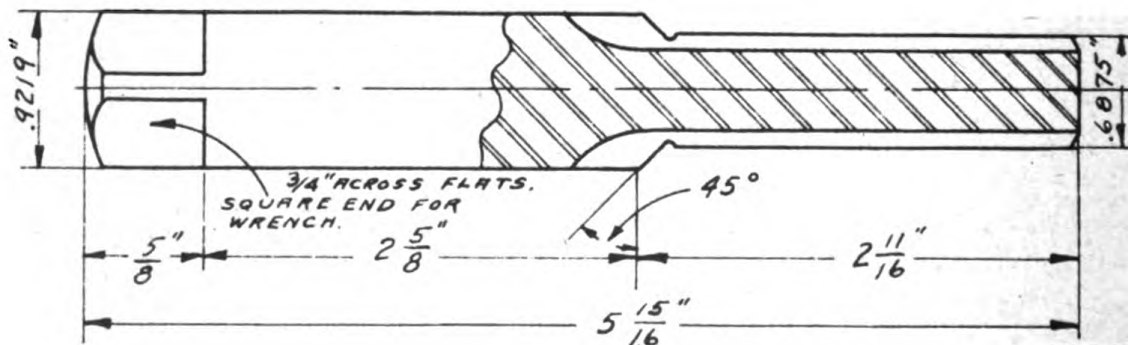


Illustration No. 7  
No. 71784 Combination Stem and Seat Reamer  
For Reaming No. 60289 Throttle Valve Bushing

- (e) Internal air leakages, due to improper seating of No. 60292 Throttle Valve against No. 60289 Throttle Valve Bushing which are noticeable at motor end of No. 66116 Throttle Assembly when No. 60292 Throttle Valve is in the closed or "OFF" position may be stopped without removal and replacement of No. 60289 Throttle Valve Bushing.
- (1) To obtain an air tight fit between seat on No. 60292 Valve and No. 60289 Bushing, work seat of No. 60292 Valve against seat on No. 60289 Bushing, using lard oil.
  - (2) No. 71785 Wrench (Illustration No. 6) may be used.
  - (3) A mixture of fine emery (#120) and lard oil may be used as a cutting medium at the two seats ONLY if the oil fails to produce the required results. (The lapping compound should never be used on Valve or Bushing surfaces when working in Valve as described previously. It is ONLY USED AS A CUTTING MEDIUM AT THE TWO SEATS.)
  - (4) On completion of the operation, it is essential that all parts be cleaned thoroughly in solvent to remove all traces of the abrasive lapping compound.

#### Reassembly of Throttle Control Unit

1. Clean all parts in solvent and lubricate with OE-10 oil.
2. Apply a small amount of CG-0 grease to outside surface of No. 66111 Throttle Stem Assembly before reassembly with No. 66115 Operating Sleeve.
3. Refer to Illustration No. 4, page 11, which indicates the sequence in which the separate parts of Throttle Handle Unit are reassembled.

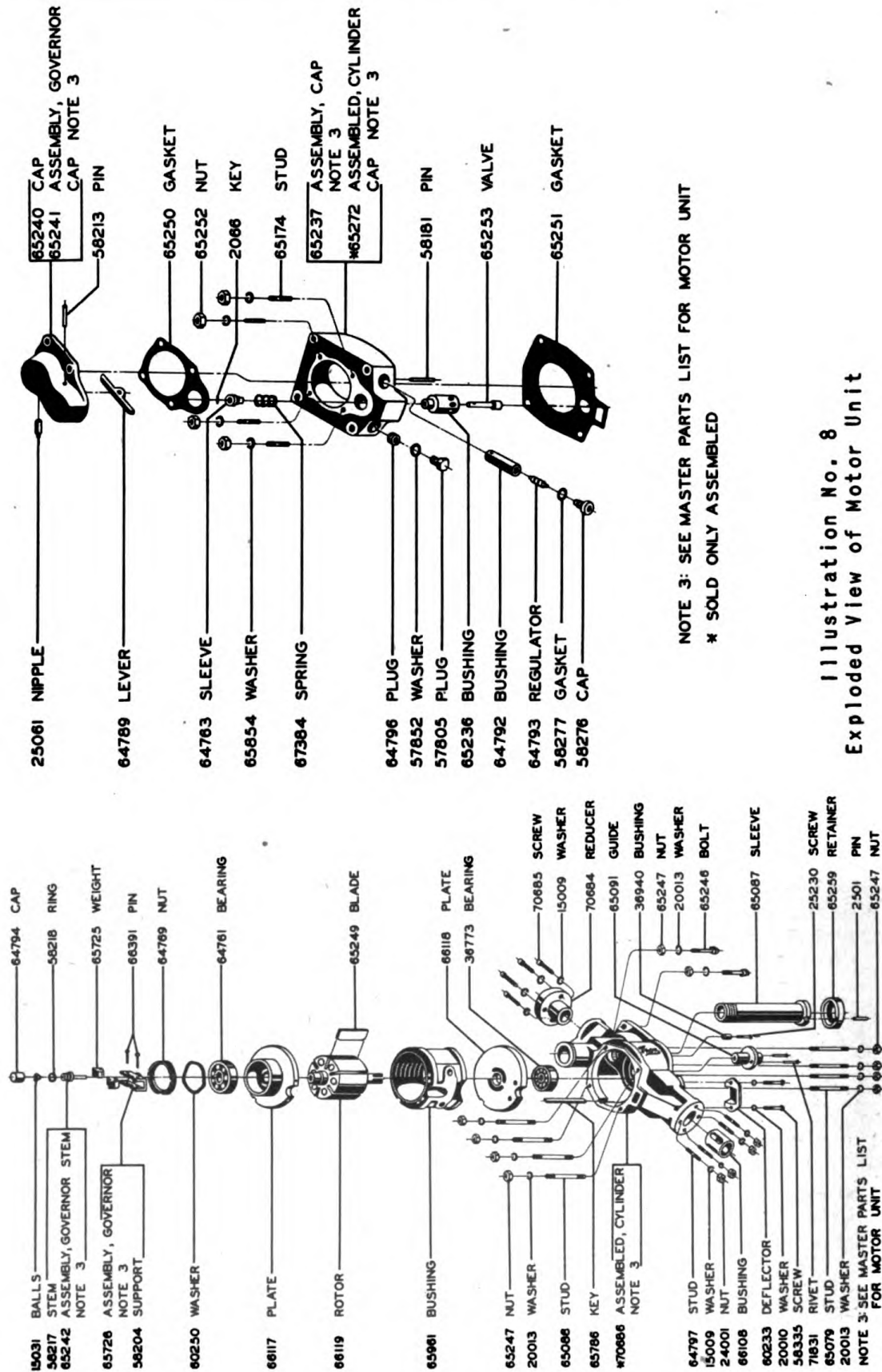


Illustration No. 8  
Exploded View of Motor Unit

MOTOR UNIT

Preliminary to servicing the motor unit proper, remove No. 36191 Dead Handle (Illustration No. 9, and the Grip Handle Unit (Illustration No. 10) or the Feed Screw Unit (Illustration No. 11).

No. 36191 Dead Handle (Illustration No. 9) is removed by unscrewing in a left hand or counter-clockwise rotation from No. 70684 Dead Handle Reducer (Illustration No. 8, page 16).

The Grip Handle Unit (Illustration No. 10) is removed after loosening No. 65260 Grip Handle Lock Nut by turning in a right hand or clockwise rotation. No. 65261 Grip Handle is screwed out with a left hand or counter-clockwise rotation, after which the No. 65306 Grip Handle Ejecting Pin Extension and No. 65307 Grip Handle Ejecting Pin Extension Guide can be dropped out from the upper end of motor unit.

The Feed Screw Unit (Illustration No. 11) is removed by unscrewing No. 65270 Feed Sleeve Guide Clamp Nut in left hand or counter-clockwise rotation and continuing with the same direction of rotation of the No. 66508 Feed Handle, until the entire Feed Screw Unit is unscrewed from the motor unit.

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No. 64758 Feed Screw Center, which has a press fit in No. 64791 Feed Screw Cap, is removed and replaced after unscrewing No. 64791 Feed Screw Cap in left hand or counter-clockwise rotation from No. 65134 Feed Screw.

No. 66508 Feed Handle is keyed to No. 65134 Feed Screw with No. 60332 Key.

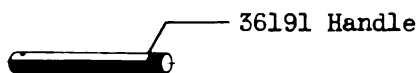


Illustration No. 9  
No. 36191 Dead Handle

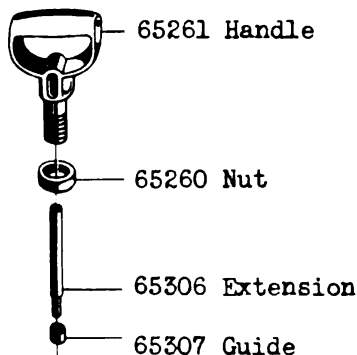


Illustration No. 10  
Grip Handle Unit

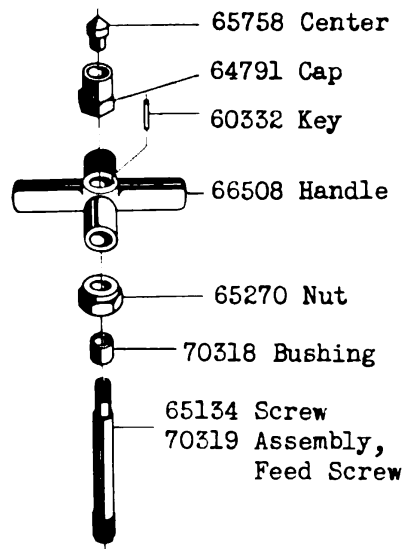


Illustration No. 11  
Feed Screw Unit

The Motor Unit, consisting of several small assemblies in addition to individual motor parts, should be totally dismantled, all parts carefully inspected, repaired or replaced if necessary, lubricated and reassembled as per the following instructions.

Illustration No. 8, page 16, indicates the order in which the separate motor parts are disassembled.

NOTE: All motor parts are contained in 3 housings: 1. No. 65241 Governor Cap Assembly, 2. No. 65237 Cylinder Cap Assembly, 3. No. 70686 Cylinder Assembly.

No. 65250 Governor Cap Gasket and No. 65251 Cylinder and Cap Gasket lie between and separate the 3 housings.

### INSPECTION AND SERVICING

Parts to be Inspected in No. 65241 Governor Cap Assembly:

No. 64789 Governor Lever

1. To insure proper governor valve action, it is very important that No. 64789 Governor Lever be replaced after any appreciable wear at its end, as shown in Illustration No. 12.

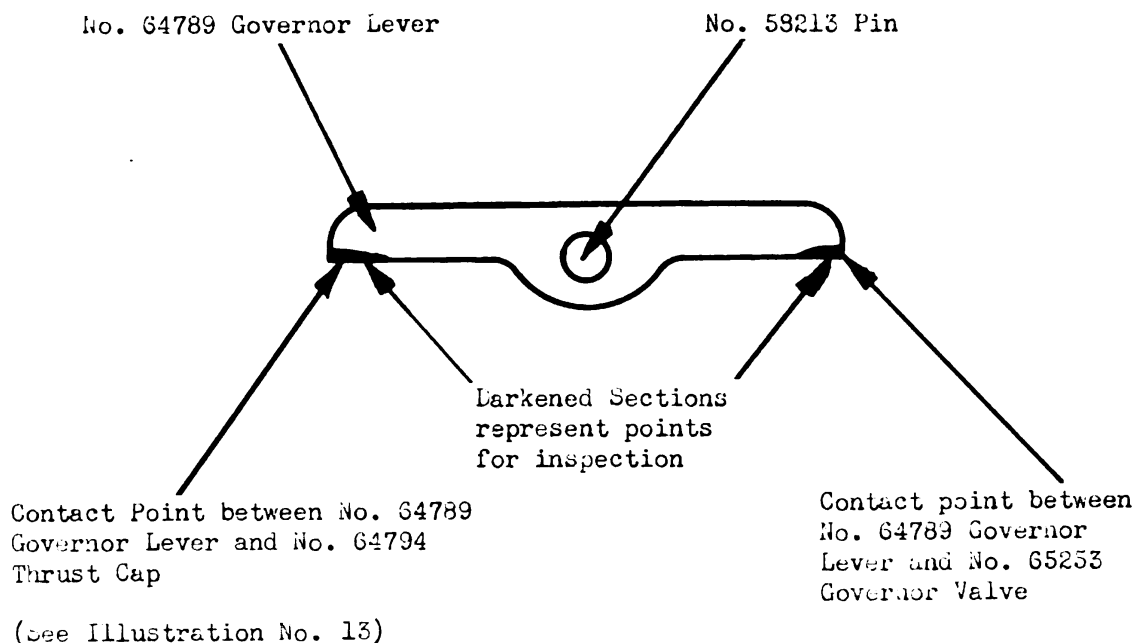


Illustration No. 12  
Points of Inspection for No. 64789 Governor Lever

2. Under normal operating conditions, the No. 64789 Governor Lever should be replaced once every 2048 hours. When replacement is necessary, also replace the No. 58213 Governor Lever Pin so that a fairly snug fulcrum point is obtained.
3. No. 64789 Governor Lever is removed by driving out No. 58213 Governor Lever Pin.

#### No. 65250 Gasket

No. 65250 Gasket, located between No. 65241 Governor Cap Assembly and No. 65237 Cylinder Cap Assembly, should be replaced if broken.

#### Parts to be Inspected in No. 65237 Cylinder Cap Assembly

##### No. 65253 Governor Valve and No. 65236 Governor Valve Bushing

No. 65253 Governor Valve, which fluctuates back and forth in No. 65236 Governor Valve Bushing, thereby regulating the amount of air passing into the Motor, is removed as follows: Depress No. 64763 Guide Sleeve and remove No. 2066 Valve Key.

##### Replacement of No. 65236 Governor Valve Bushing

1. A snug slip fit should exist between the No. 65253 Governor Valve and No. 65236 Governor Valve Bushing. Therefore, if the No. 65263 Governor Valve feels fairly loose in the No. 65236 Governor Valve Bushing or if a dark circular strip is present in the location of the air holes, the No. 65236 Governor Valve Bushing should be replaced.
2. The No. 65236 Governor Valve Bushing is pressed out of and into the No. 65237 Cylinder Cap Assembly by means of a small hand press.
3. It is very important that the No. 65236 Governor Valve Bushing is assembled so that the motor end of the No. 65236 Bushing is flush with the motor side of the No. 65237 Cylinder Cap Assembly.

**Fitting No. 65253 Governor Valve into No. 65236 Governor Valve Bushing**

To secure a snug, air tight fit between the No. 65253 Governor Valve and the No. 65236 Governor Valve Bushing, a fitting operation must be carefully performed.

1. If the No. 65253 Valve may be inserted directly into the No. 65236 Bushing, but tends to bind or stick, its movement may be freed up by working No. 65253 Governor Valve back and forth in the No. 65236 Bushing in a rotational movement. A lard oil should be used for freeing up No. 65253 Governor Valve.
2. To hold the No. 65253 Valve securely when working it in, turn down a piece of soft wood so that it may be snugly fitted into open end of the No. 65253 Valve. (Under no circumstances should the wood be forced or tightly wedged into the No. 65253 Governor Valve since this may bulge the No. 65253 Valve out of round.)
3. If the No. 65253 Governor Valve cannot be inserted directly into the new No. 65236 Governor Valve Bushing as described above, ream the No. 65236 Governor Valve Bushing with a straight reamer, (the size of which is the same size as the No. 65253 Valve.)
4. No. 65253 Valve may now be inserted into No. 65236 Valve Bushing and, if necessary, freed up using lard oil. NEVER USE AN ABRASIVE LAPPING COMPOUND.
5. On completion of the above fitting operations, remove all traces of the lard oil with solvent.

**No. 67384 Governor Valve Spring**

The compression rating for No. 67384 Governor Valve Spring lies between 12 lbs.-3 ozs. and 13 lbs.-7 ozs., when compressed to 3/8" length. If the compression rating of the Spring is less than the lower value, it should be replaced.

**No. 64793 Oil Regulator and No. 58277 Cap Gasket**

1. No. 64793 Oil Regulator should be removed and cleaned thoroughly in solvent.



2. Care must be taken so as not to burr its edges.
3. If the No. 64793 Oil Regulator tends to stick in the No. 64792 Oil Regulator Bushing, a threaded rod (No. 6 x 32 Thr. R.H.U.S.S.) can be screwed into No. 64793 Oil Regulator to work the Regulator loose. (For this reason No. 64793 Regulator must always be assembled so that its tapped hole faces outward.)
4. No. 58277 Cap Gasket should be replaced if broken and leaking air.

**No. 57852 Oil Plug Washer**

No. 57852 Washer, located under No. 57805 Oil Plug, should be replaced if broken and leaking air. The Oil Reservoir must be tight for efficient operation of the automatic oiling system.

**No. 65251 Cap Gasket**

No. 65251 Cap Gasket which lies between No. 65237 Cylinder Cap Assembly and No. 70686 Cylinder Assembly, should be replaced if broken.

**Disassembly of Parts Contained in No. 70686 Cylinder Assembly**

1. No. 65242 Governor Stem Assembly lifts out the upper end of No. 66119 Rotor.
2. No. 65726 Governor Assembly screws off No. 66119 Rotor in a clockwise or right hand direction (LEFT HAND THREAD).
  - (a) To hold No. 66119 Rotor from turning when unscrewing No. 65726 Governor Assembly, clamp pinion end of rotor between two blocks of wood in a vise. (Wood blocks are used so as not to burr pinion teeth on No. 66119 Rotor.)
3. No. 66119 Rotor and No. 66117 Upper Center Plate are removed from the No. 70686 Cylinder Assembly by tapping the pinion end of No. 66119 Rotor with a soft or plastic hammer so as not to burr pinion teeth.
4. No. 65961 Cylinder Bushing, No. 66118 Lower Center Plate and No. 36773 Lower Rotor Bearing are removed through the upper end of the No. 70686 Cylinder Assembly.

**MOTOR PARTS TO BE INSPECTED**

**No. 65242 Governor Stem Assembly**

1. If the convex surface at top of No. 64794 Thrust Cap is appreciably worn off, the No. 64794 Cap should be replaced. (See Illustration No. 13).

2. The No. 64794 Thrust Cap pulls off the No. 58218 Thrust Cap Retainer Ring, which encircles the No. 58217 Governor Support Stem.
3. Wash the parts in solvent and dry with blasts of air.
4. Place a small amount of CG-0 grease into the No. 64794 Thrust Cap to lubricate the three No. 15031 Thrust Balls.
5. Reassemble Governor Stem in reverse order.

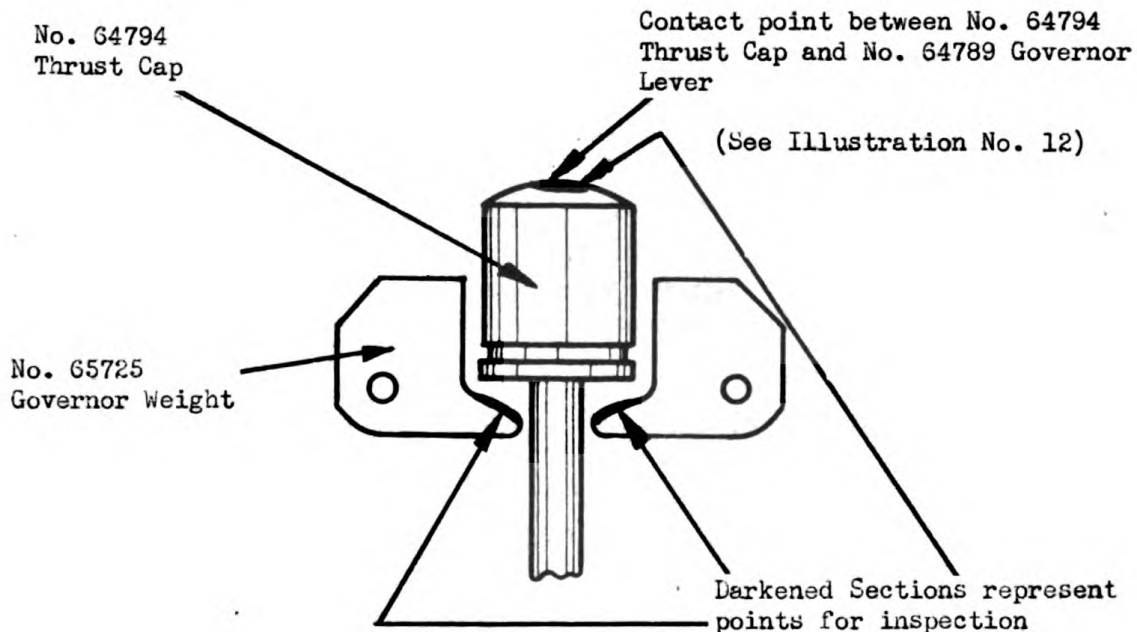


Illustration No. 13  
Points of Inspection for No. 64794 Thrust Cap  
and No. 65725 Governor Weights

#### No. 65726 Governor Assembly

1. Inspect the (2) No. 65725 Governor Weights at points as shown in Illustration No. 13. If the No. 65725 Governor Weights are considerably worn at these points, they should be replaced.
2. Drive out the (2) No. 66391 Governor Weight Pins to remove the No. 65725 Governor Weights from No. 58204 Governor Weight Support.
3. After reassembling No. 65725 Governor Weights into No. 58204 Governor Weight Support, lubricate with CG-0 grease.
4. Make certain that the (2) No. 65725 Governor Weights are free to tip back and forth in groove. (Any foreign object such as a small chip wedged between No. 65725 Governor Weight and No. 58204 Governor Weight Support will interfere with the free operation of the Governor Weight.)

# No. 65249 Rotor Blades

1. The 6 No. 65249 Rotor Blades are inexpensive and should be replaced when the smallest width of the blade is  $\frac{5}{8}$ " or less as shown in Illustration No. 14.
2. If No. 65249 Rotor Blade should expand due to heat, in which case its free movement in rotor slot is retarded, the Blade should be replaced.

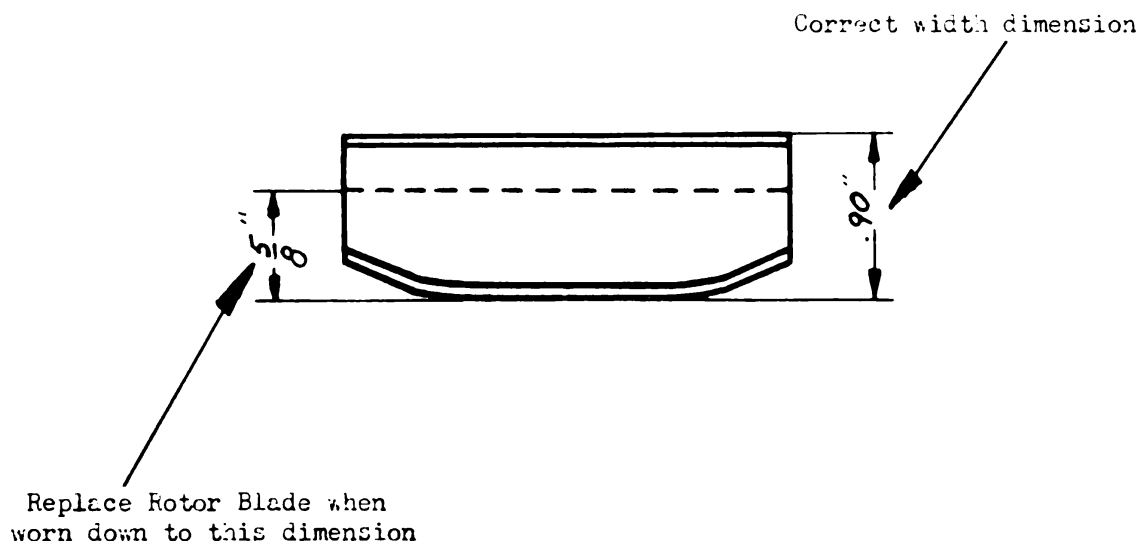


Illustration No. 14  
New and Worn Width Dimensions of No. 65249 Rotor Blade

3. Clean out Rotor Slots in No. 66119 Rotor before inserting the Rotor Blades.
4. Insert the No. 65249 Rotor Blades so that the long straight edge faces outward.
5. Lubricate the Rotor Blades only with a light machine oil (OE-10) -- Never with Grease.

## No. 64761 Upper and No. 36773 Lower Rotor Bearings

No. 64761 Upper and No. 36773 Lower Rotor Bearings should always feel firm. If the Inner and Outer Ball Race can be deflected in opposite parallel directions, the ball race grooves are most likely worn in width, resulting in end play, in which case the Bearing should be replaced. Also, note whether outer Ball Race tends to bind or stick when spinning the Bearing.

Worn Bearings with considerable end play cause No. 66119 Rotor to drag against No. 66117 Upper and No. 66118 Lower Center Plates, and in time will result in loss of operating efficiency. Worn Bearings also cause abnormal wear of Pinion Teeth at end of No. 66119 Rotor.

Never try to clean a ball bearing by blowing out the old grease with compressed air. Compressed air often contains abrasives which may become lodged in the bearing causing rapid failure. A Ball Bearing should be washed by submerging it in a solvent, holding the inner Ball Race and spinning the Outer Ball Race under the surface of the solvent until clean.

When pressing ball bearing onto a shaft, apply pressure to the Inner Ball Race. When pressing Bearing into a seat or socket, apply pressure to the Outer Ball Race. Pressure applied through the balls may cause slight indentation of the ball race grooves, resulting in rapid bearing failure.

#### No. 65961 Cylinder Bushing

In time, continuous pressure of the 6 No. 65249 Rotor Blades will cause wear to the inside surface of No. 65961 Cylinder Bushing, characterized by a scratchy and wavy appearance. When this condition appears, No. 65961 Cylinder Bushing should be replaced.

#### No. 66117 Upper and No. 66118 Lower Center Plates

Worn No. 64761 Upper and No. 36773 Lower Rotor Bearings, which have considerable end play, will cause body of No. 66119 Rotor to drag against flat surface of No. 66117 Upper and No. 66118 Lower Center Plates resulting in a scratched Center Plate surface. If the surface is scratched deeply, No. 66117 Upper or No. 66118 Lower Center Plates should be replaced. When Motor Parts are correctly assembled, a clearance of .0025" should exist at each end between the body of No. 66119 Rotor and the Center Plates. (See: "Reassembly of Motor Parts" below).

#### No. 66119 Rotor

Inspection should be made of the Pinion Teeth on No. 66119 Rotor. If they appear considerably worn, burred or broken, the Rotor should be replaced.

### REASSEMBLY OF MOTOR PARTS

The following sequence of operations should be carefully followed step by step.

1. All parts should be thoroughly cleaned and lubricated before reassembling. (See: "Lubrication" page 29).
2. Insert No. 36773 Lower Rotor Bearing and properly seat it in its housing in the lower end of the No. 70686 Cylinder Assembly.
3. Apply Grease to the Bearing.
4. Lay No. 65786 Cylinder Bushing Key into Key Slot in No. 70686 Cylinder Assembly so that end with curved side lies downward and fits in contour of curve at bottom of slot.

5. Line up Key Slot in No. 66118 Lower Center Plate with No. 65786 Key and press Centerplate into No. 70686 Cylinder Assembly so that side of Center Plate with circular grooves faces upward. (Be sure No. 66118 Center Plate is properly seated in No. 70686 Cylinder Assembly.)
6. Refer to Illustration No. 8 showing the correct line up between No. 65961 Cylinder Bushing and No. 70686 Cylinder Assembly before pressing in Bushing.
  - (a) No. 65786 Cylinder Bushing Key guides No. 65961 Cylinder Bushing Inward.
  - (b) Be sure No. 65961 Cylinder Bushing lies flat and square against No. 66118 Lower Center Plate.
7. Assemble No. 64761 Upper Rotor Bearing into Bearing Housing in No. 66117 Upper Center Plate and tighten No. 64769 Nut securely.
8. Insert upper end of No. 66119 Rotor through No. 64761 Upper Rotor Bearing, assembled in No. 66117 Center Plate.
9. Screw No. 65726 Governor Assembly into upper end of No. 66119 Rotor in a left hand direction, (LEFT HAND THREAD) to clamp No. 64761 Upper Rotor Bearing on Rotor.
10. At this point, check clearance between body of No. 66119 Rotor and surface of No. 66117 Center Plate. (This clearance should be approximately .0025" but since it may vary slightly the motor unit may be considered properly assembled if No. 66119 Rotor can be turned freely without any signs of binding when motor unit is fully assembled and held in any position.
11. Place No. 65249 Rotor Blades into Rotor Slots and insert Rotor through No. 65961 Cylinder Bushing so that Key Slot in No. 66117 Upper Center Plate slides over No. 65786 Key in No. 70686 Cylinder assembly.
12. No. 65242 Governor Stem Assembly is inserted into the upper end of the No. 66119 Rotor. For smooth and positive Governor Valve action No. 65242 Governor Stem Assembly must slide freely up and down in No. 66119 Rotor.
13. Before assembling No. 65241 Governor Cap Assembly and No. 65237 Cylinder Cap Assembly to No. 70686 Cylinder Assembly it is very important to apply grease (See: "Lubrication" page 29) to No. 64761 Upper Rotor Bearing, No. 65242 Governor Stem Assembly, No. 65726 Governor Assembly, No. 64789 Governor Lever and No. 67384 Governor Valve Spring.
14. Be sure No. 65250 Governor Cap and No. 65251 Cylinder and Cap Gaskets are complete.

## GEAR CASE UNIT

The Gear Case Unit, consisting of gears, bearings, and the spindle, is the lower unit of the Tool. The parts contained in the Gear Case Unit should be cleaned, carefully inspected, replaced, if necessary, and properly reassembled.

### DISASSEMBLY OF GEAR CASE UNIT

Refer to Illustration No. 15, page 27, showing the sequence in which the Gear Case Unit parts are disassembled or reassembled.

No. 65288 Reducing Gear is supported at each end by a No. 65255 Upper Reducing Gear Bearing and No. 5008 Lower Reducing Gear Bearing. No. 65255 Upper Bearing is supported by No. 65091 Reducing gear guide (Not shown in Illustration No. 15 - See Illustration No. 8, page 16). No. 5008 Lower Bearing fits in housing in No. 65201 Gear Case Assembly. Remember that, unless it is to be replaced, the reducing gear bearing should never be removed from the part to which it is assembled when removing the Gear Case Unit from the Motor Unit, or when pulling No. 65288 Reducing Gear from the Gear Case Unit. (See No. 65255 Upper and No. 5008 Lower Reducing Gear Bearings, below).

### No. 66555 Spindle Assembly

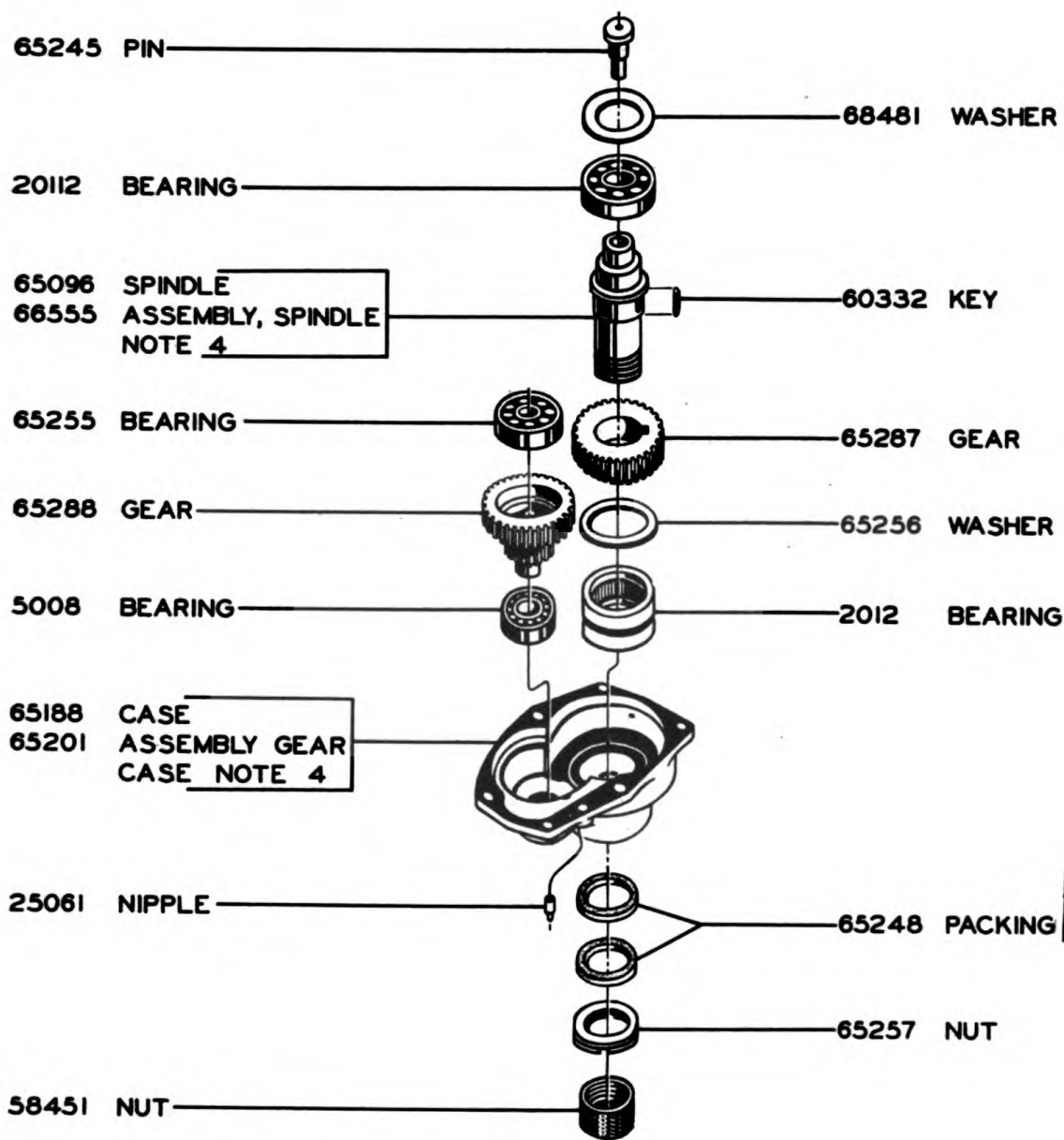
No. 66555 Spindle Assembly is removed by removing the No. 58451 Protection Nut and tapping threaded or lower end of No. 66555 Spindle Assembly with a soft or plastic hammer. Care should be taken not to burr threads on the end of the spindle.

### INSPECTION AND REPLACEMENT

#### No. 65255 Upper and No. 5008 Lower Reducing Gear Bearings

If the No. 65255 Upper and No. 5008 Lower Reducing Gear Bearings need to be replaced, they are removed by using a No. 71822 Bearing Puller, Illustration No. 13 as follows:

1. Clamp long straight end of No. 71822 Bearing Puller securely in a vise.

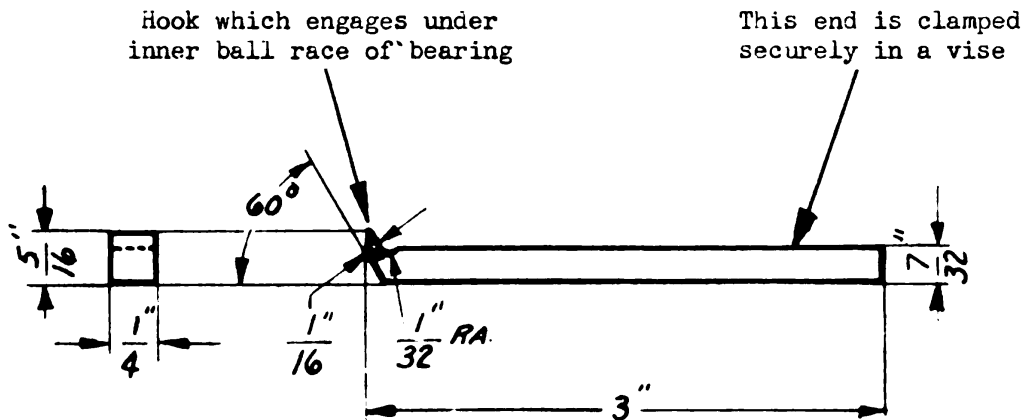


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NOTE 4: SEE MASTER PARTS LIST FOR GEAR  
CASE UNIT

Illustration No. 15  
Exploded View of Gear Case Unit

2. Place back top side of inner ball race of bearing over hook end of No. 71822 Bearing Puller so that the hooked end of No. 71822 Bearing Puller lies between the housing and the inner ball race.
3. Rotate No. 65201 Gear Case slightly and tap using a soft or plastic hammer.



(Note: Material must be hardened and drawn for maximum strength).

**Illustration No. 16**  
**No. 71822 Bearing Puller for Removing Bearing from Housing**

#### **No. 65288 Reducing Gear**

Before pressing in No. 65255 Upper Reducing Gear Bearing, inspect the gear teeth on No. 65288 Reducing Gear. If they are burred, broken or considerably worn down, No. 65288 Reducing Gear should be replaced.

#### **No. 20112 Upper Spindle Bearing**

When removing the Gear Case Unit from the Motor Unit, the No. 20112 Upper Spindle Bearing may remain in housing of Motor Unit or it may remain on the No. 65096 Spindle.

Remember that, unless it is to be replaced, the No. 20112 Upper Spindle Bearing should never be removed from the part to which it is assembled when removing the Gear Case Unit from the Motor Unit, or when pulling No. 65096 Spindle from the Gear Case Unit.

A worn No. 20112 Upper Spindle Bearing may be removed from its housing in the Motor Unit by tapping with a rod which has been inserted through the No. 65087 Feed Screw Sleeve. The No. 65245 Ejecting Pin will force the No. 20112 Bearing from the Cylinder housing.

A worn No. 20112 Upper Spindle Bearing may be removed from the No. 65096 Spindle by using an arbor press.



**No. 65287 Spindle Gear**

No. 65287 Spindle Gear should be replaced if gear teeth are burred, broken or considerably worn down.

**No. 65248 Spindle Packings**

No. 65248 Spindle Packings (two) should be cleaned in gasoline or a similar solvent. If the No. 65248 Packings are worn, they should be replaced to insure proper seal at spindle end of tool. When reassembling No. 65248 Spindle Packings take care to tighten No. 65257 Clamp Nut for lower spindle bearing snug against No. 2012 Lower Spindle Bearing but not so tightly as to cause binding.

**REASSEMBLY OF GEAR CASE UNIT**

1. Clean all parts in solvent and lubricate with a OE-10 oil.
2. Pack all bearings with proper grease. (See "Lubricants" page 30).
3. The gear case unit is reassembled in reverse order of procedure to the order in which it was taken apart. (That is, parts disassembled last are to be reassembled first.)
4. Fill the Gear Case Unit  $\frac{2}{3}$  full of proper grade grease before reassembling the 3 Major Units.

**FINAL SERVICING OPERATIONS****Reassembly - 3 Major Units**

1. After careful servicing of each Major Unit as per preceding instructions, the individual units may be assembled together to complete the assembly of the Drill.
2. No. 65126 Gasket for Throttle Handle Stem should be complete and if not, it should be replaced to insure an air tight seal between the Handle and Motor Units.
3. Tighten all nuts evenly and securely.

**FIELD LUBRICATION**

Proper and sufficient lubrication is the most important single factor in keeping performance of the drill at a maximum and repair at a minimum.

**29****Oil Lubrication (every four hours)**

1. Apply proper grade of oil through No. 57805 Oil Plug Hole to fill Oil Reservoir.
2. Apply proper grade of oil through oil hole in No. 66115 Operating Sleeve.

## Grease Lubrication

1. Apply proper grade of grease lubricant through the two (2) No. 25061 Grease Nipples with a high pressure grease gun every 64 hours.

## LUBRICATION SPECIFICATIONS

	Temperatures	U. S. Army Symbol
Oil	Below 32° F.	OE-10 (oil, engine, SAE-10)
	Above 32° F.	Mixture of equal amounts of OE-10 and OE-30 oils. (oil, engine, SAE-10 and SAE-30)
Grease	Below 32° F.	CG-0 (grease, general purpose, No. 0)
	Above 32° F.	CG-1 (grease, general purpose, No. 1)

Always use clean oil. Under no circumstances should old crank case oil be used.

Oil or grease which has been standing in an open container collecting dust and dirt should not be used.

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PARTS LIST

CROSS SECTION VIEWS

EXPLODED VIEWS

# PREPARATION OF REQUISITIONS

## Sample Copy for Use in the Preparation of Requisitions

Revisions in QMC Form 400 for requisitioning spare parts are confined to new column headings. Until new forms are available all organizations are to continue using the present form and either type or write in corrections indicated in column headings.

Under revised heading "Nomenclature and Unit" list the article and the unit (ea for each; lb for pound, etc.). Under heading "Authorized or Maximum Level" list the authorized depot stock levels or organizational allowances given in Part III of the Corps of Engineers Supply Catalog. The total number on hand for each item is listed under "On Hand". In column

headed "Due In" enter the total quantity previously requisitioned but not delivered. For "Initial" and "Replenishment" requisitions, the sum of "Required", "Due In", and "On Hand" should equal the "Authorized or Maximum Level".

On this page is shown a sample requisition on QMC Form No. 400 which conforms to the latest revisions. The marginal notes give instructions for preparing a requisition for spare parts for Engineer equipment. Additional information on this subject is contained in section AA-1 of Part III Engineer Supply Catalog, available from the Engineer Field Maintenance Office, P. O. Box 1679, Columbus, Ohio.

- State PERIOD designation by use of one of the following terms:
- (1) "INITIAL"—first requisition of authorized allowances.
  - (2) "REPLENISHMENT"—subsequent requisitions to maintain authorized allowances.
  - (3) "SPECIAL"—requisitions for necessary repairs not covered by allowances.

Type "SPARE PARTS" in upper right hand corner of requisition.

Give complete shipping instructions. Special instructions for packing, marking, routing, etc., should be given at the end of the requisition.

State proper nomenclature of machine, also make, model, machine serial number and U. S. A. registration number.

Prepare a separate requisition for each different machine.

State basis or authority and date delivery is required, immediately below description of machine.

Double space between items.

Group parts required under group headings as shown in manufacturers' parts catalogs (Technical Manuals).

State manufacturers parts numbers and nomenclature descriptions accurately and completely. Do not use abbreviations.

(SAMPLE)

**SPARE PARTS**

**REQUISITION**

WAR DEPARTMENT  
Q. M. C. Form No. 400  
Revised April 1, 1941

To: **Engineer Field Maintenance Office,** No. of Sheets **1** Sheet No. **1**  
P. O. Box 1679, Columbus, Ohio

Requisition No. **E-531-3-43** Date **10 October, 1943** Period **Special**

SHIP TO **Engineer Property Officer, Pine Camp, New York**  
MARKED FOR: **Engineer Supply Officer, 802nd Engr. Battalion, Pine Camp, N. Y.**

Illustrations By (show signature, Rank, Organization, Destination If different from "SHIP TO" include address):  
**Robert E. Roe**  
Robert E. Roe,  
Major, C.E.,  
Engineer Property Officer

Approved By:  
**John E. Doe**  
John E. Doe,  
Col., C.E.,  
Executive Officer

SYMBOL SER. NO.	NOMENCLATURE AND UNIT	AUTHORIZED OR MAXIMUM LEVEL	ON HAND	DUPLICATE DUE IN	REQUIRED	APPROVED
<b>PARTS FOR DRILL, PNEUMATIC, ROTARY TYPE, PORTABLE, REVERSIBLE, NO. 3</b>						
<b>MORSE TAPER, 1 INCH CAPACITY, INDEPENDENT PNEUMATIC TOOL CO., THOR., NO. 75204-3, MODEL NO. 5121, SERIAL NO. 785, 486, U. S. A. REG. NO. W-174-ENG-1956.</b>						
Basis: Repair of disabled equipment						
Delivery requested by 24 October 1943						
<b>THROTTLE UNIT</b>						
60293	SPRING, throttle	ea	-	0	0	1
57912	STRAINER	ea	-	0	0	1
<b>MOTOR UNIT</b>						
65249	BLADE, rotor	ea	-	0	0	6

\*Nonexpendable items such as tools must be accounted for, when requisitioned, by a statement that they have been placed on REPORT OF SURVEY or STATEMENT OF CHARGES.

Emergency requisitions sent by telephone, telegraph or radio must always be confirmed immediately with requisition marked: "Confirming (state identifying data)."

## PREPARATION OF REQUISITIONS

A sample requisition in the correct form for submission by the Engineer Property Officer is shown on the opposite page.

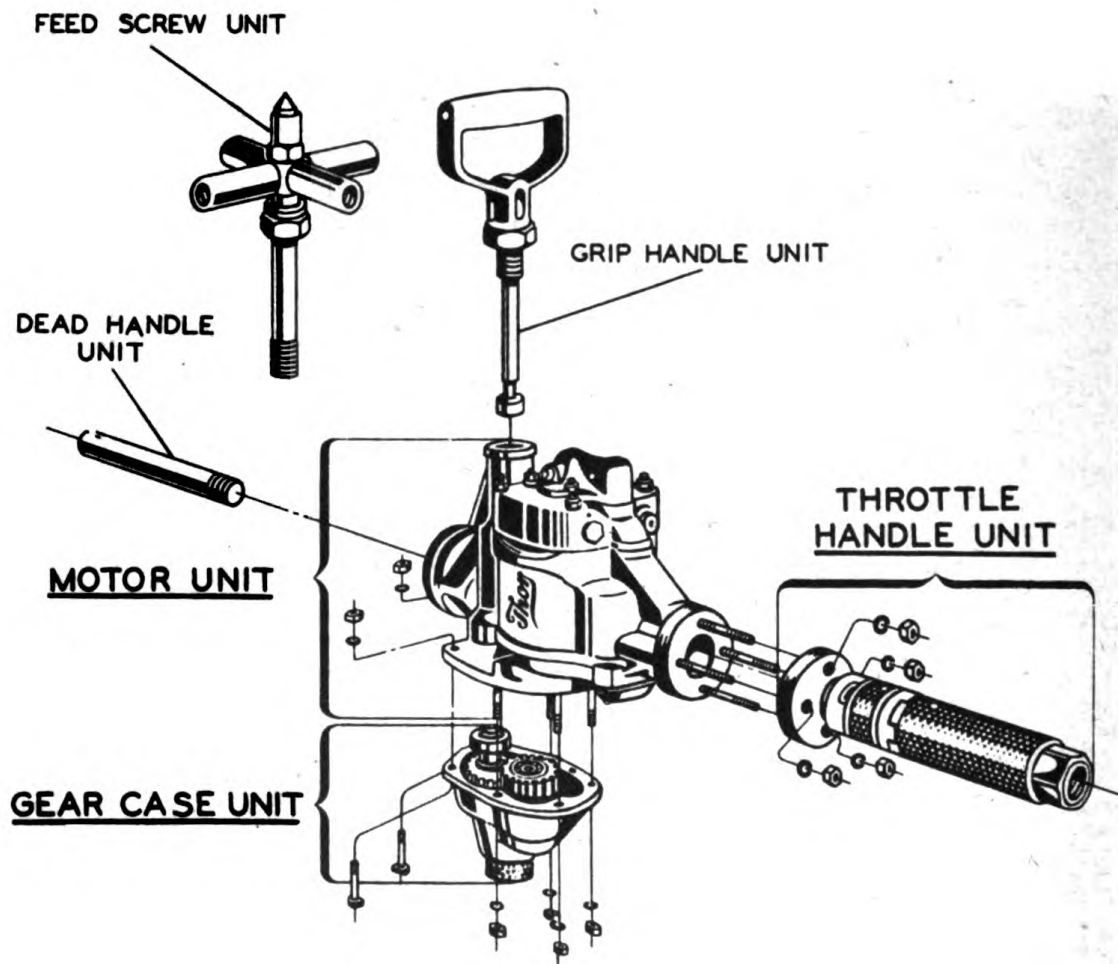
### THIS SHALL BE FOLLOWED IN MAKING OUT REQUISITIONS

In order to eliminate duplication of work, Property Officers may authorize organizations to prepare requisitions in final form, leaving requisition number space blank for completion by Property Officer.

### THE FOLLOWING RULES WILL BE OBSERVED CAREFULLY IN PREPARING REQUISITIONS FOR SPARE PARTS:

- a. Prepare a separate requisition for each different machine.
- b. Type "SPARE PARTS" in upper right hand corner of requisition form.
- c. State PERIOD designation by use of one of the following terms:
  - (1) "INITIAL"—first requisition of authorized allowances.
  - (2) "REPLENISHMENT"—subsequent requisitions to maintain authorized allowances.
  - (3) "SPECIAL"—requisitions for necessary repairs not covered by allowances.
- d. Give complete shipping instructions.
- e. State proper nomenclature of machine, and make, model, serial number and registration number.
- f. State basis of authority, and date delivery is required, immediately below description of machine.
- g. Group parts required under group headings as shown in manufacturer's parts catalogs.
- h. State manufacturers' parts numbers and nomenclature descriptions accurately and completely. Do not use abbreviations.
- i. Double space between items.
- j. Emergency requisitions sent by telephone, telegraph, or radio must always be confirmed immediately with requisition marked: "Confirming (state identifying data)."
- k. Nonexpendable items must be accounted for.

## EXPLODED VIEW OF COMPLETE TOOL





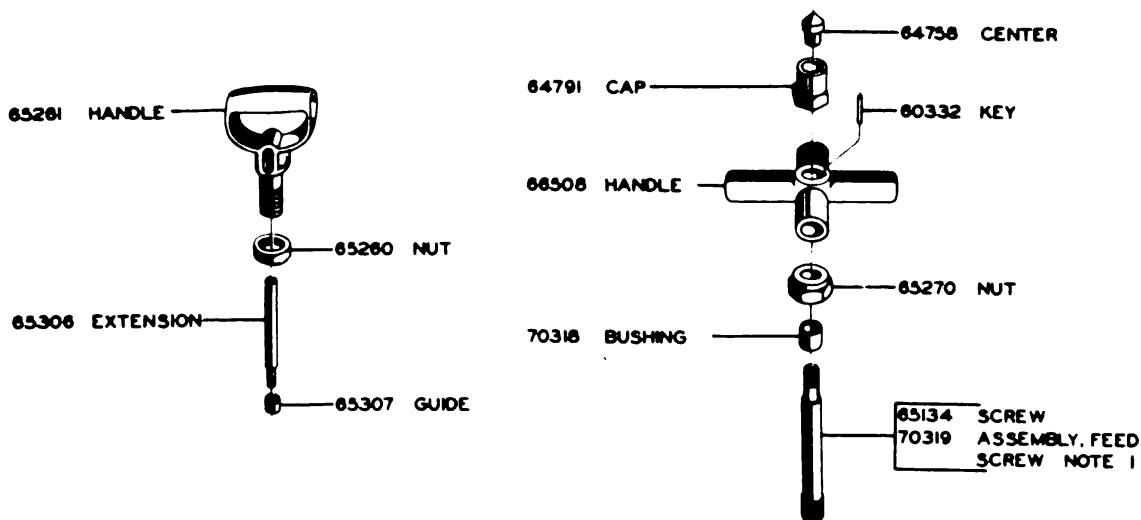
NUMERICAL PARTS LIST  
FOR GRIP HANDLE AND FEED SCREW UNITS

Mfr's. Part No.	Nomenclature	No. of Parts Per Tool	Wt. Each in lbs.	Price Per Part
60332	Key, feed handle . . . . .	1		\$ .10
64758	Center, feed screw . . . . .	1		1.00
64791	Cap, feed screw. . . . .	1	1/4	.95
65134	Screw, feed. . . . .	1	7/8	6.00
65260	Nut, grip handle lock. . . . .	1	1/4	.50
65261	Handle, grip . . . . .	1	1-1/4	3.75
65270	Nut, feed sleeve guide clamp . .	1	1/4	.90
65306	Extension, grip handle ejecting pin . . . . .	1	3/8	.85
65307	Guide, grip handle ejecting pin extension . . . . .	1		.50
66508	Handle, feed . . . . .	1	3/4	2.25
70318	Bushing, feed screw guide. . . .	1		.45
70319	Assembly, feed screw includes: (1) No. 66508 Handle, feed (1) No. 65134 Screw, feed (1) No. 60332 Key, feed handle (1) No. 64758 Center, feed screw (1) No. 70318 Bushing, feed screw guide (1) No. 65270 Nut, feed sleeve guide clamp (1) No. 64791 Cap, feed screw	1	2-1/4	11.00

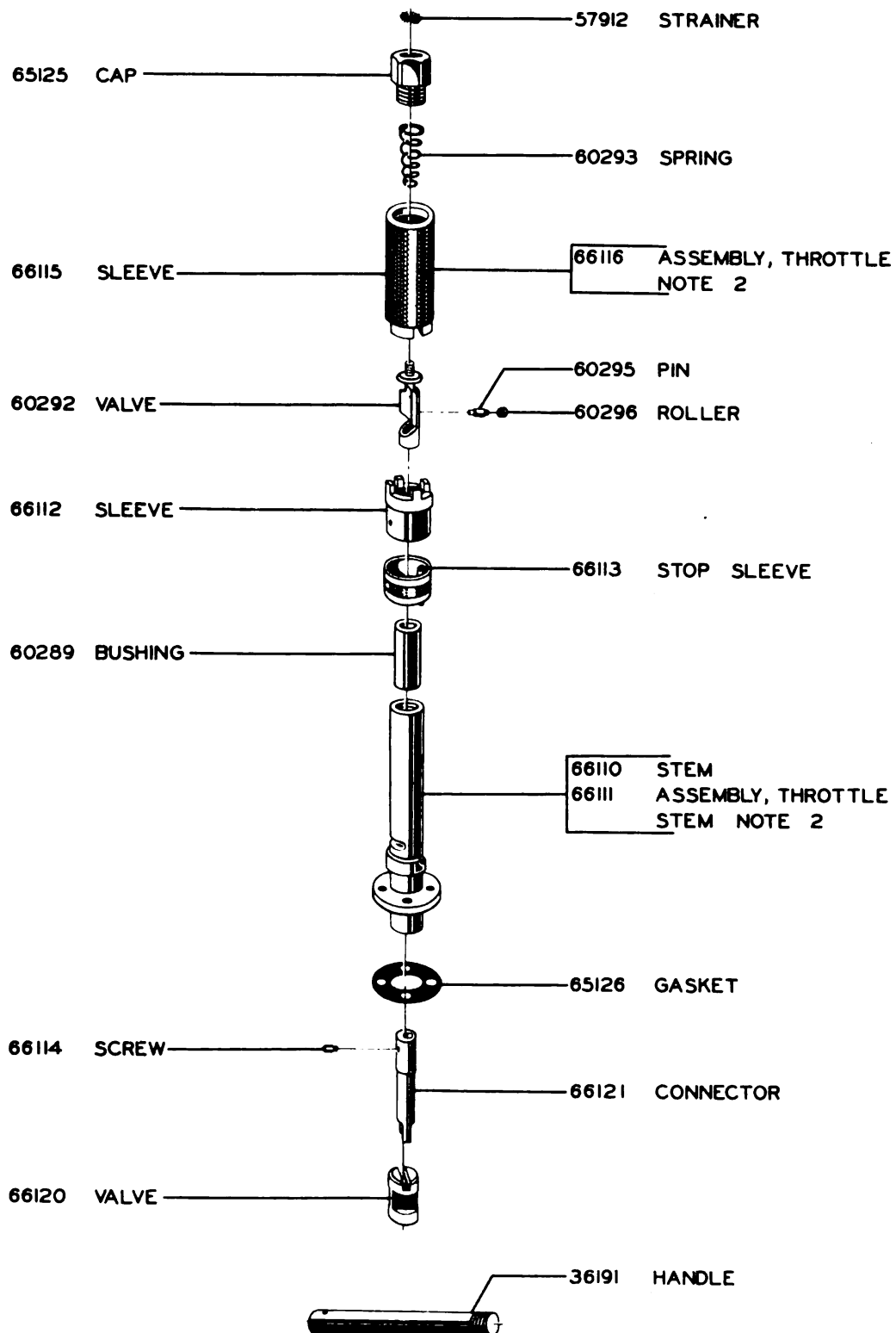
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EXPLODED VIEW OF GRIP HANDLE AND FEED SCREW UNIT



# EXPLODED VIEW OF THROTTLE HANDLE UNIT AND DEAD HANDLE UNIT



NOTE 2: SEE MASTER PARTS LIST FOR THROTTLE  
AND DEAD HANDLE UNITS

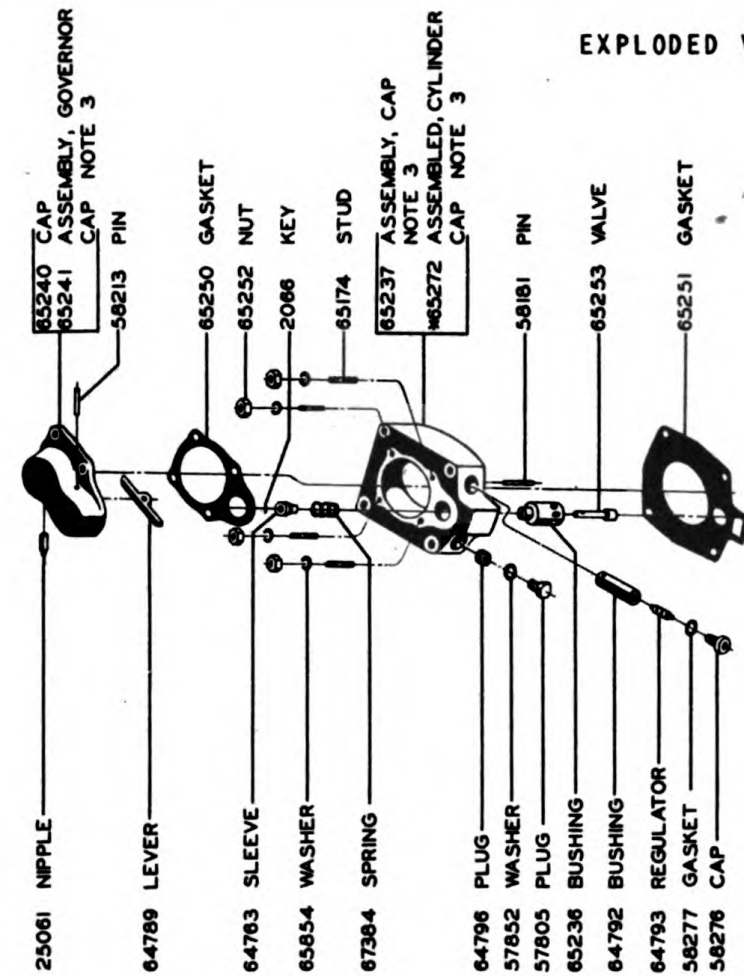
NUMERICAL PARTS LIST  
FOR THROTTLE AND DEAD HANDLE UNITS

Mfr's. Part No.	Nomenclature	No. of Parts Per Tool	Wt. Each in lbs.	Price Per Part
36191	Handle, dead 3/4" pipe thread. .	1	1-1/2	\$1.75
57912	Strainer . . . . .	1		.10
60289	Bushing, throttle valve. . . . .	1	1/4	1.25
60292	Valve, throttle. . . . .	1		1.90
60293	Spring, throttle . . . . .	1		.15
60295	Pin, operating valve . . . . .	1		.10
60296	Roller, operating valve. . . . .	1		.10
65125	Cap, throttle, 1/2" pipe thread Briggs standard . . . . .	1	3/8	1.15
65126	Gasket, throttle handle stem . .	1		.10
66110	Stem, throttle . . . . .	1	2	7.50
66111	Assembly, throttle stem includes: (1) No. 66110 Stem, throttle (1) No. 60289 Bushing, throttle	1	2-1/4	8.50
66112	Sleeve, throttle . . . . .	1	3/4	2.75
66113	Sleeve, stop . . . . .	1		1.10
66114	Screw, Valve connector . . . . .	1		.20
66115	Sleeve, operating. . . . .	1	1/2	2.25
66116	Assembly, throttle includes: (1) No. 66111 Assembly, throttle stem. (1) No. 66112 Sleeve, throttle (1) No. 65125 Cap, throttle (1) No. 60292 Valve, throttle (1) No. 60293 Spring, throttle (1) No. 60295 Pin, operating valve (1) No. 57912 Strainer (1) No. 66113 Stop Sleeve (1) No. 66114 Screw, valve connector (1) No. 66115 Sleeve, operating (1) No. 60296 Roller, operating valve (1) No. 66121 Connector, valve	1	4-3/8	21.50
66120	Valve, reversing . . . . .	1	1/4	3.00
66121	Connector, valve . . . . .	1	3/8	2.75

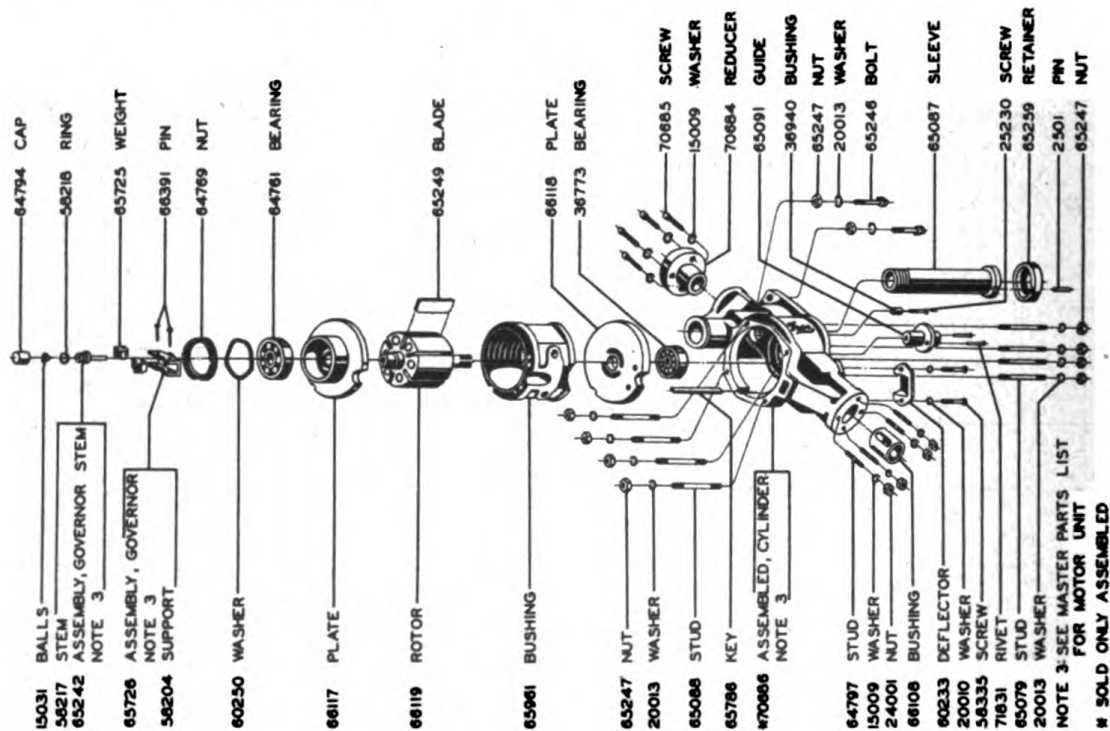
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## EXPLODED VIEW OF MOTOR UNIT



NOTE 3: SEE MASTER PARTS LIST FOR MOTOR UNIT  
\* SOLD ONLY ASSEMBLED



## NUMERICAL PARTS LIST FOR MOTOR UNIT

Mfr's. Part No.	Nomenclature	No. of Parts Per Tool	Wt. Each in Lbs.	Price Per Part
2066	Key, governor valve. . . . .	1		\$ .05
2501	Pin, feed screw sleeve retainer.	1		.05
15009	Washer, throttle handle stud and reducer cap screw . . . . .	8		.05
15031	Ball, governor stem 3/16". . . .	3		.02
20010	Washer, deflector screw. . . . .	2		.05
20013	Washer, gear case and cylinder bolt and studs. . . . .	10		.05
24001	Nut, throttle handle stud. . . .	4		.05
25061	Nipple, governor cap grease. . .	1		.10
25230	Screw, dowel bushing . . . . .	1		.05
36773	Bearing, lower rotor . . . . .	1	1/4	2.90
36940	Bushing, cylinder dowel. . . . .	1		.10
57805	Plug, cylinder cap oil . . . . .	1		.20
57852	Washer, oil plug . . . . .	1		.05
58181	Pin, oil regulator bushing . . . .	1		.05
58204	Support, governor weight . . . .	1		2.25
58213	Pin, governor lever. . . . .	1		.05
58217	Stem, governor support . . . . .	1		.85
58218	Ring, thrust cap retainer. . . .	1		.10
58276	Cap, oil regulator . . . . .	1		.40
58277	Gasket, oil regulator cap. . . . .	1		.05
58335	Screw, deflector . . . . .	2		.05
60233	Deflector. . . . .	1		.85
60250	Washer, upper rotor bearing clamp nut . . . . .	1		.20
64761	Bearing, upper rotor . . . . .	1	1/4	1.50
64763	Sleeve, governor valve guide . .	1		.35
64769	Nut, upper rotor bearing . . . .	1		.65
64789	Lever, governor. . . . .	1		.50
64792	Bushing, oil regulator . . . . .	1		.35
64793	Regulator, oil . . . . .	1		.10
64794	Cap, governor stem thrust. . . .	1		.75
64796	Plug, cap threaded . . . . .	1		.25
64797	Stud, throttle handle stem . . .	4		.15
65079	Stud, cylinder and gear case . .	4		.15
65087	Sleeve, feed screw . . . . .	1	3/4	5.40
65088	Stud, cylinder and cap . . . . .	4		.10
65091	Guide, reducing gear . . . . .	1		1.25
65174	Stud, cylinder and governor cap.	4		.10
65236	Bushing, governor valve. . . . .	1		1.20

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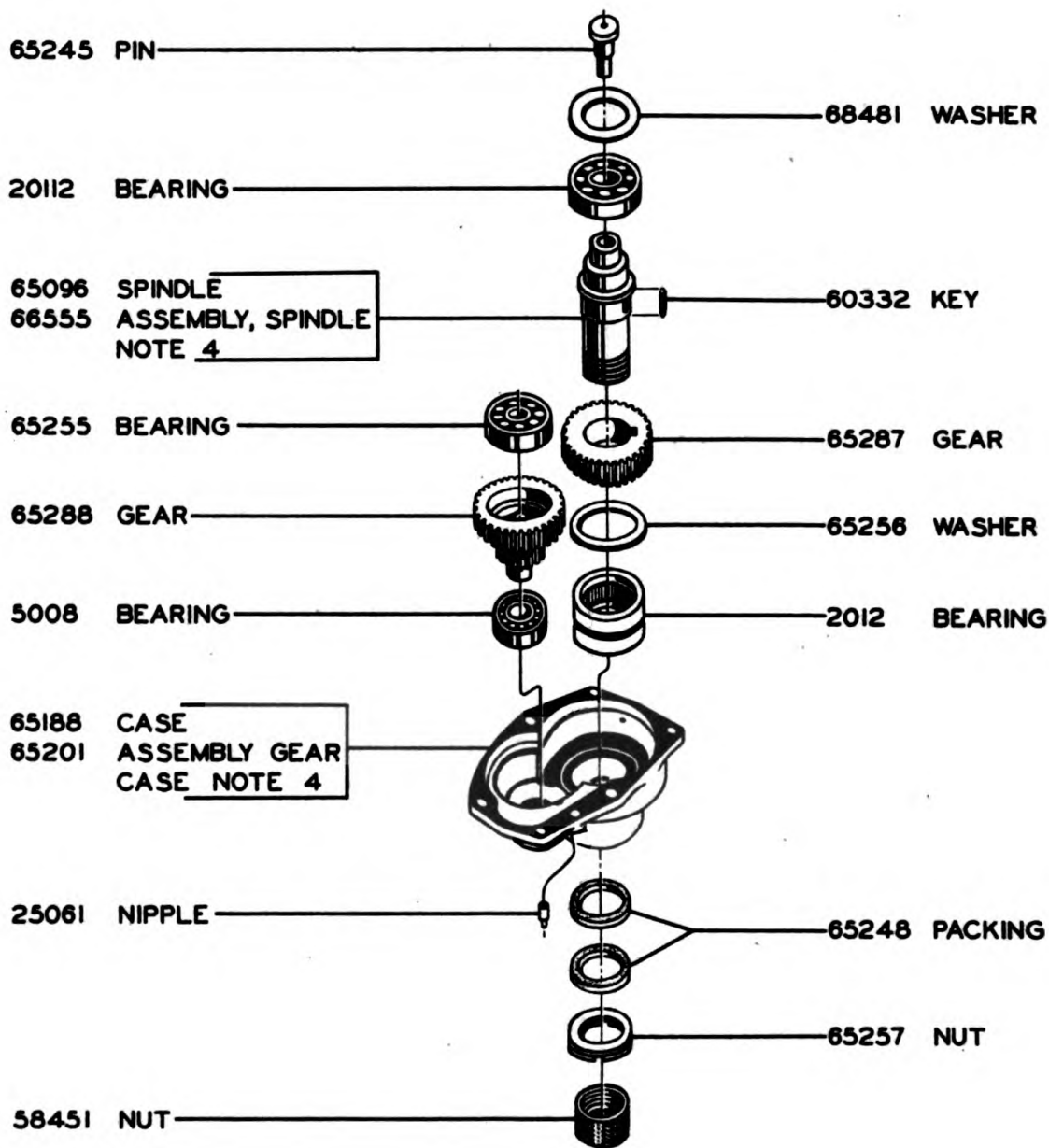
## NUMERICAL PARTS LIST FOR MOTOR UNIT - Continued

Mfr's. Part No.	Nomenclature	No. of Parts Per Tool	Wt. Each in lbs.	Price Per Part
65237	Assembly, cylinder cap complete includes: (1) No. 57805 Plug, oil (1) No. 65272 Assembled, cylinder cap (1) No. 57852 Washer, oil plug (1) No. 65236 Bushing, governor valve (1) No. 58276 Cap, regulator (1) No. 58277 Gasket, regulator cap (1) No. 64793 Regulator, oil (1) No. 64796 Plug, cap threaded	1	1/4	10.75
65240	Cap, governor. . . . .	1	1/4	4.00
65241	Assembly, governor cap includes: (1) No. 58213 Pin, governor lever (1) No. 65240 Cap, governor (1) No. 64789 Lever, governor (1) No. 25061 Grease Nipple	1	1/4	4.60
65242	Assembly, governor stem includes: (3) No. 15031 Balls, governor stem 3/16" (1) No. 58217 Stem, governor support (1) No. 58218 Ring, thrust cap retainer (1) No. 64794 Cap, governor stem thrust	1		1.85
65246	Bolt, gear case. . . . .	2		.10
65247	Nut, gear case and cylinder bolt and studs . . . . .	10		.05
65249	Blade, Rotor . . . . .	6		.35
65250	Gasket, governor cap . . . . .	1		.10
65251	Gasket, cylinder and cap . . . . .	1		.15
65252	Nut, cylinder and governor cap stud. . . . .	4		.05
65253	Valve, governor. . . . .	1		1.25
65259	Retainer, feed screw sleeve. . .	1	1/4	1.00
65272	Assembled, cylinder cap includes: (1) No. 58181 Pin, regulator bushing (1) No. 64792 Bushing, oil regulator (4) No. 65174 Stud	1		8.85
65725	Weight, governor . . . . .	2		1.00

## NUMERICAL PARTS LIST FOR MOTOR UNIT - Continued

Mfr's. Part No.	Nomenclature	No. of Parts Per Tool	Wt. Each in lbs.	Price Per Part
65726	Assembly, governor includes: (2) No. 65725 Weight, governor (1) No. 58204 Support, weight (2) No. 66391 Pin, governor weight	1		\$4.25
65786	Key, bushing and end plate . . .	1		.10
65854	Washer, cylinder and governor cap stud. . . . .	4		.05
65961	Bushing, cylinder. . . . .	1	1-1/2	13.30
66108	Bushing, reverse valve . . . . .	1		2.50
66117	Plate, upper center. . . . .	1	7/8	10.15
66118	Plate, lower center. . . . .	1	3/4	8.85
66119	Rotor. . . . .	1	2-1/4	17.50
66391	Pin, governor weight . . . . .	2		.05
67384	Spring, governor valve . . . . .	1		.40
70684	Reducer, dead handle . . . . .	1	3/4	1.50
70685	Screw, dead handle reducer cap .	4		.15
70686	Assembly, cylinder includes: (1) No. 25230 Screw, dowel bushing (1) No. 70684 Reducer, dead handle (1) No. 2501 Pin, feed screw sleeve retainer (4) No. 70685 Screw, dead handle reducer cap (4) No. 65079 Stud, cylinder (1) No. 65087 Sleeve, feed screw (1) No. 66108 Bushing revers- ing valve (4) No. 65088 Stud, cylinder and cap (1) No. 65091 Guide, reducing gear (4) No. 64797 Stud, throttle handle stem (1) No. 36940 Bushing, cylinder dowel (2) No. 71831 Rivet	1	2	41.50
71831	Rivets, reducing gear guide. . .	2		.03

## EXPLODED VIEW OF GEAR CASE UNIT



NOTE 4: SEE MASTER PARTS LIST FOR GEAR CASE UNIT



## NUMERICAL PARTS LIST FOR GEAR CASE UNIT

Mfr's. Part No.	Nomenclature	No. of Parts Per Tool	Wt. Each in lbs.	Price Per Part
2012	Bearing, lower spindle . . . . .	1	1/4	\$4.50
5008	Bearing, lower reducing gear . .	1	1/4	1.90
20112	Bearing, upper spindle . . . . .	1	1/4	1.25
25061	Nipple, gear case grease . . . . .	1		.10
58451	Nut, protection. . . . .	1	1/4	.80
60332	Key, spindle gear. . . . .	1		.10
65096	Spindle, No. 3 M.T. (1.375" x 12 Thread) R.H.U.S.S. . . . .	1	1-1/4	10.75
65188	Case, gear . . . . .	1	2-1/4	12.00
65201	Assembly, gear case includes: (1) No. 65188 Case, gear (1) No. 25061 Nipple, gear case grease	1	2-1/4	12.10
65245	Pin, ejecting. . . . .	1		.95
65248	Packing, spindle . . . . .	2		.20
65255	Bearing, upper reducing gear . .	1	1/4	1.15
65256	Washer, lower spindle bearing. .	1		.15
65257	Nut, lower spindle bearing clamp	1	1/4	1.50
65287	Gear, spindle. . . . .	1	3/4	5.00
65288	Gear, reducing . . . . .	1	5/8	4.00
66555	Assembly, spindle includes: (1) No. 65287 Gear, spindle (1) No. 60332 Key, spindle gear (1) No. 65096 Spindle	1	1-7/8	15.50
68481	Washer, retainer pin and bearing spacing . . . . .	1		.20

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## INDEPENDENT PNEUMATIC TOOL CO.

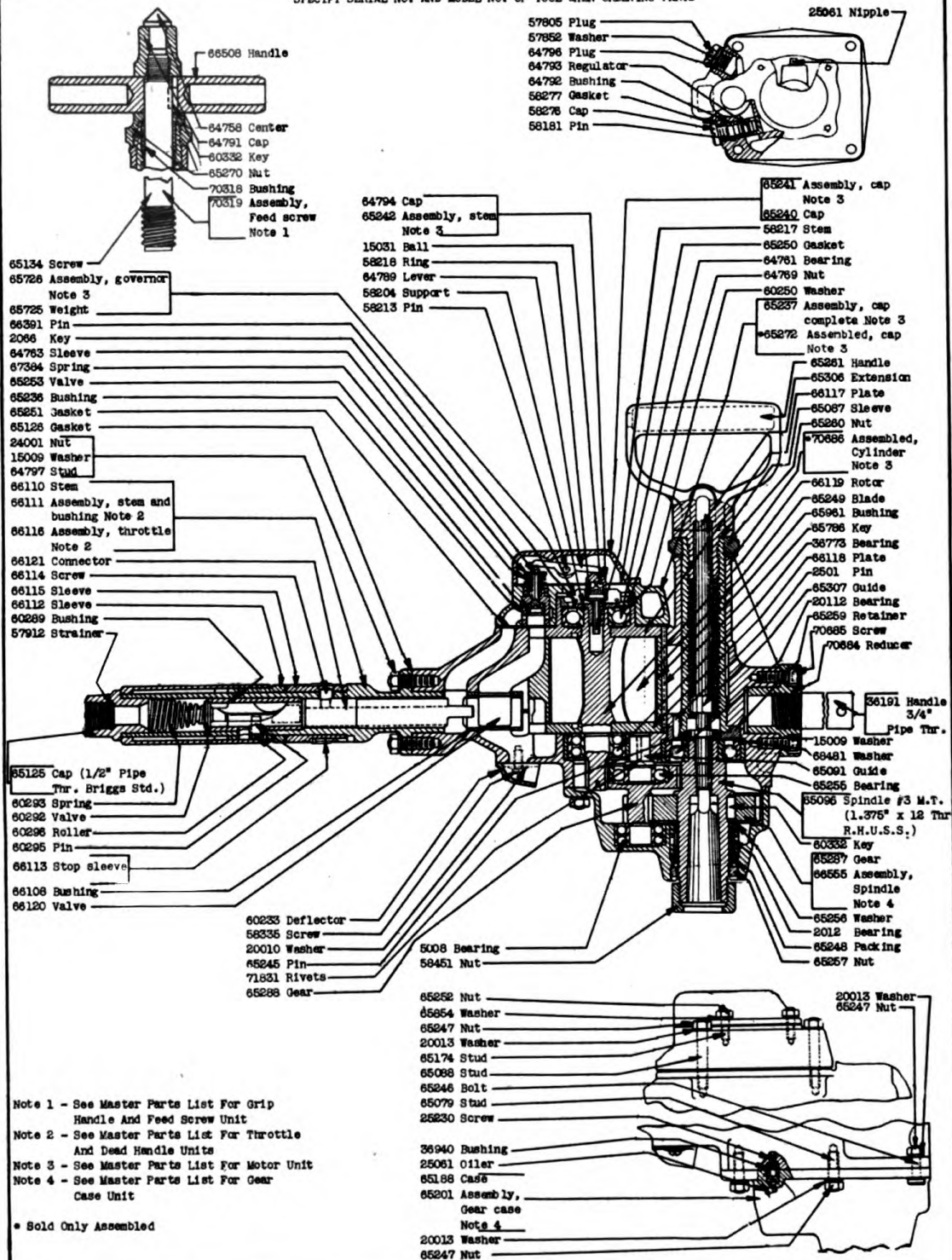
CHICAGO ILL.

## PNEUMATIC ROTARY DRILL

NO. 362 RX-3

MODEL NO. 5121

SPECIFY SERIAL NO. AND MODEL NO. OF TOOL WHEN ORDERING PARTS



Printed in The United States of America

